

## **Problem solving practice**

**This file contains over 600 problem solving and data sufficiency questions for the GMAT with full answers and explanations.**

**Good luck on your test.**

1. 15 Java programmers, working in a constant pace, finish a web page in 3 days. If after one day, 9 programmers quit, how many more days are needed to finish the remainder of the job?

- (a) 5.
- (b) 2.
- (c) 8.
- (d) 4.
- (e) 6.

The best answer is A.

The total working days for finishing a web page are  $(15 \times 3) 45$ . If after one day 9 programmers quit, only 15 working days are done and the rest of the programmers (6) Need to finish  $(45 - 15) 30$  days of work. It will take them 5 more days.

2. Two carpenters, working in the same pace, can build 2 desks in two hours and a half. How many desks can 4 carpenters build in 4 hours?

- (a) 2.4.
- (b) 3.6.
- (c) 4.2.
- (d) 5.5.
- (e) 6.4

The best answer is E.

2 carpenters build 2 desks in 2.5 hours ---> 4 carpenters build 4 desks in 2.5 hours ----  
> In 4 hours there are  $(4/2.5 = 1.6)$  time units. And  $(4 \times 1.6)$  is 6.4 desks.

6. There are 40 students in a classroom,  $9/20$  of them are boys and  $4/5$  of them are right-handed. How many right-handed boys are there in the classroom?

- (a) Between 10 and 32.
- (b) Between 14 and 32.
- (c) Between 10 and 18.
- (d) Between 14 and 18.
- (e) Between 18 and 36.

The best answer is C.

There are  $(9/20 \times 40 = 18)$  boys in the class. 80% of them are right-handed, meaning that  $(4/5 \times 18 = 14.4)$ . Answer C is the best answer.

7. In Jonathan's pen there are 300 sheep's.  $5/6$  of the sheep's are white,  $2/3$  of the sheep's have soft wool. What can't be the number of white sheep's that also have soft wool in the pen?

- (a) 100.
- (b) 200.
- (c) 190.
- (d) 180.
- (e) 160.

The best answer is A.

There are  $(\frac{5}{6} \times 300 = 250)$  white sheep's.

There are  $(\frac{2}{3} \times 300 = 200)$  soft woolen sheep's.

The maximum overlap is the size of the smallest among the groups, thus 200. The minimum overlap is  $(250 + 200 - 300 = 150)$ .

Therefore the number of sheep's can be somewhere between 150 and 200.

8. Ross has 40 shirts,  $\frac{3}{4}$  of the shirts are green and  $\frac{1}{10}$  is without buttons. Therefore Ross has between \_\_\_ and \_\_\_ shirts with buttons that are not green.
- (a) 6 ; 10.
  - (b) 4 ; 25.
  - (c) 4 ; 10.
  - (d) 5 ; 25.
  - (e) 3 ; 10.

The best answer is A.

Notice that the groups that we are looking for a overlapping are the not-green shirts and the buttoned ones. The not-green shirts are a quarter of 40, 10 shirts.

The shirts with buttons are  $(\frac{9}{10} \times 40 = 36)$ .

The maximum overlapping is the size of the smallest group: 10.

The minimum overlapping is:  $36 + 10 - 40 = 6$ .

Therefore A is the answer.

9. In the Kan film festival, 50 movies were presented.  $\frac{3}{5}$  of the movies are action movies and  $\frac{4}{5}$  is science fiction movies. How many of the movies were science fiction action movies?
- (a) 10.
  - (b) 15.
  - (c) 20.
  - (d) 30.
  - (e) 35.

The best answer is C.

There were  $(\frac{3}{5} \times 50 = 30)$  action movies.

There were  $(\frac{4}{5} \times 50 = 40)$  science fiction movies.

Exact overlapping is calculated by minimum overlapping method.

Therefore there are  $(40 + 30 - 50 = 20)$  movies that belong to both categories.

10. There are 200 cats in Cat-City. Out of the 200, 70 are street cats and the rest are domestic cats. 110 cats are gray, 30 out of the gray cats are domestic ones. How many domestic cats are there which are not gray in Cat-City?

- (a) 90.
- (b) 80.
- (c) 50.
- (d) 40.
- (e) 25.

The best answer is C.

Out of 200 cats, 130 are domestic ones. Out of 110 gray cats, 30 are street cats therefore 80 are grey and domestic ones.

Altogether there are 130 domestic cats, 80 are grey so  $(130 - 80) = 50$  are not grey.

11. Chandler is building a fence in the following method: He grounds 10 poles, each 10 Cm thick, in 1 meter spaces from each other. He then connects the poles with a barbed wire. What is the total length of the fence?

- (a) 11.
- (b) 12.
- (c) 9.9.
- (d) 10.
- (e) 13.

The best answer is D.

The total width of the poles is  $(10 \times 0.1 = 1)$  meter.

There are 9 spaces between the poles, each 1 meter, so it's another 9 meters.

The total length is  $(1 + 9 = 10)$  meters.

12. In a psychology school the grade of the students is determined by the following method: At the end of the first year the grade equals to twice the age of the student. From then on, the grade is determined by twice the age of the student plus half of his grade from the previous year. If Joey's grade at the end of the first year is 40, what will be his grade at the end of the third year?

- (a) 75.
- (b) 62.
- (c) 80.
- (d) 44.
- (e) 56.

The best answer is A.

From the grade 40 at the end of the first year we learn that his age is 20.

At the end of the second year, he will be 21 and his grade will be

$$(21 \times 2 + \frac{1}{2} \times 40 = 62).$$

At the end of the third year, he will be 22 and his grade will be  $(22 \times 2 + \frac{1}{2} \times 62 =$

75).

13. What is the sum of all the even numbers bigger than (-10) and smaller than 12?

- (a) 2.
- (b) 10.
- (c) 0.
- (d) 8.
- (e) 4.

The best answer is B.

This is a series of numbers with a constant spacing between them.

The first number is (-8) and the last is (10), there are 10 numbers altogether.

The formula for such a series is:  $((-8 + 10) \times 10)/2 = 10$ .

The second way to answer such a question is to write the numbers and add them.

14. The value of an "Aerosoul" stock changes according to the following method:  
At the end of each month her value is doubled but due to commission the stock's value is decreases by \$10. If the value at the beginning of January is \$A, what would be her value at the end of February?

- (a)  $4A - 10$ .
- (b)  $4A - 20$ .
- (c)  $4A - 30$ .
- (d)  $4A - 40$ .
- (e)  $4A - 50$ .

The best answer is C.

At the end of January her value is  $2A - 10$ .

At the end of February her value is  $(2 \times (2A - 10) - 10 = 4A - 30)$ .

15. An Ameba is an organic life form that divides into two Amebas each round hour. If at a certain round hour, two Amebas were placed in a jar, how many Amebas will be in the jar in N hours?

- (a)  $2N$
- (b)  $2^{2N}$
- (c)  $2^{N+1}$
- (d)  $2^{N-1}$
- (e)  $2^N$

The best answer is C.

Let's find the number of Amebas in the first hours.

After one hour (N=1) there will be 4 Amebas.

After two hours (N=2) there will be 8 Amebas.

After three hours (N=3) there will be 16 amebas.

Therefore the formula that fits this series is  $2^{N+1}$ .

16. Alfa, Beta and Gamma are inner angles in a triangle. If Alfa = Beta + Gamma, what can't be the size of Beta?

- (a) 44 degrees.
- (b) 45 degrees.
- (c) 89 degrees.
- (d) 90 degrees.
- (e) There isn't enough data to determine.

The best answer is D.

If Beta is 90 degrees then Alfa is bigger than 90 and the sum of the angles in the triangle will be bigger than 180 degrees.

18. In a triangle, one side is 6 Cm and another side is 9 Cm. which of the following can be the perimeter of the triangle?

- (a) 18.
- (b) 25.
- (c) 30.
- (d) 32.
- (e) 34.

The best answer is B.

The third side of the triangle is larger than 3 (The difference between the other two) and smaller than 15 (The sum of the other two).

The perimeter is between  $(6+9+3 = 18)$  and  $(6+9+15 = 30)$ . The only answer that is in this range is B.

19. To which of the following shapes the area can't be calculated if the perimeter is given?

- (a) Circle.
- (b) An isosceles right triangle.
- (c) Rectangle.
- (d) A regular Hexagon.
- (e) Square.

The best answer is C.

The perimeter of a rectangle is  $2a + 2b$ . In order to calculate the area we need to know the multiplication of  $a \times b$ .

20. A and B are two circles. The radius of A is twice as large as the diameter of B. What is the ratio between the areas of the circles?

- (a) 1:8.

- (b) 1:2.
- (c) 1:4.
- (d) 1:16.
- (e) 1:6.

The best answer is D.

The radius of circle A is 4 times larger than the radius of circle B. The area of a circle is a function of the radius squared, therefore the area of radius A is 16 times bigger.

21. A, B, C, D and E are 5 consecutive points on a straight line. If  $BC = 2CD$ ,  $DE = 4$ ,  $AB = 5$  and  $AC = 11$ , what is the length of AE?

- (a) 21.
- (b) 26.
- (c) 30.
- (d) 18.
- (e) 16.

The best answer is D.

First, draw the line and the points.

In order to find the length of AE, find the length of CD and BC first.

$$BC = AC - AB = 11 - 5 = 6.$$

$$BC = 2CD \rightarrow CD = 3.$$

$$AE = 5 + 6 + 3 + 4 = 18.$$

22. In a rectangular axis system, what is the distance between the following points: A(3,2) and B(7,5) ?

- (a) 5.
- (b) 7.
- (c) 6.
- (d) 4.
- (e) 3.

The best answer is A.

First, draw a rectangular axis system and mark the two points.

The easiest way to find the distance between them is to draw a triangle, where the line AB is the hypotenuse. You can see that the length of one side of the triangle is  $(5-2=3)$  and the other side is  $(7-3=4)$ . The length of the line AB is received with the help

Of the Pythagoras principle:  $AB = \sqrt{3^2 + 4^2} = 5$ .

23. In a rectangular axis system, what is approximate distance between the following points: C(1,2.5) and D(6.5,5.5) ?

- (a) 5.5.
- (b) 7.2.
- (c) 6.3.
- (d) 4.1.
- (e) 3.8.

The best answer is C.

First, draw a rectangular axis system and mark the two points.

The easiest way to find the distance between them is to draw a triangle, where the line CD is the hypotenuse. You can see that the length of one side of the triangle is  $(5.5 - 2.5 = 3)$  and the other side is  $(6.5 - 1 = 5.5)$ . The length of the line CD is

received with the help Of the Pythagoras principle:  $CD = \sqrt{3^2 + 5.5^2} = \sqrt{39.25} \cong 6.3$ .

24. In a rectangular axis system, what is the distance between the following points: A(24.4,30) and B(34.4,42.49) ?

(a) 5.

(b) 7.

(c) 8.

(d) 12.

(e) 16.

The best answer is A.

First, draw a rectangular axis system and mark the two points.

The easiest way to find the distance between them is to draw a triangle, where the line AB is the hypotenuse. You can see that the length of one side of the triangle is  $(34.4 - 24.4 = 10)$  and the other side is  $(42.49 - 30 = 12.49)$ . The length of the line AB is received with the help

Of the Pythagoras principle:  $AB = \sqrt{10^2 + 12.49^2} = \sqrt{256} = 16$ .

25. In a rectangular axis system, what is the area of a parallelogram with the coordinates: (5,7), (12,7), (2,3), (9,3) ?

(a) 21.

(b) 28.

(c) 35.

(d) 49.

(e) 52.

The best answer is B.

First, draw the axis system and mark the 4 points. Connect the points to get a parallelogram. The area is calculated by the multiplication of one on of the bases and the height. The height is  $(7 - 3 = 4)$ , the length of the base is  $(9 - 2 = 7)$ .

The area is  $4 \times 7 = 28$ .

29. If the radius of a cylinder is doubled and so is the height, what is the new volume of the cylinder divided by the old one?

(a) 8.

(b) 2.

(c) 6.

(d) 4.

(e) 10.

The best answer is A.

The volume of a cylinder is  $(\pi \times R^2) \times (\text{height of cylinder})$ .

The new volume is  $(4 \times 2 = 8)$  bigger.

30. If the radius of a cylinder is doubled and so is the height, how much bigger is the new lateral surface area (with out the bases)?

(a) 8.

(b) 2.

(c) 6.

(d) 4.

(e) 10.

The best answer is D.

The lateral surface area of a cylinder is  $(2 \times \pi \times R) \times (\text{height of cylinder})$ .

The new lateral surface area is  $(2 \times \pi \times 2R) \times (\text{double the height}) = 4$  times bigger.

1. If  $X \sim Y = X^2 + XY$ , then what is the value of  $-1 \sim 2$  ?

(a) 1.

(b) -1.

(c) 3.

(d) 4.

(e) 2.

The best answer is B.

$-1 \sim 2 = (-1)^2 + (-1)2 = -1$ .

2. If  $X \sim Y = XY^2$ , then what is the value of  $3 \sim (t-1)$  ?

(a)  $3t^2 - 2t + 2$ .

(b)  $3t^2 - 2t + 4$ .

(c)  $3t^2 - 6t + 3$ .

(d)  $3t^2 - 6t - 3$ .

(e)  $3t^2 - 6 + 3$ .

The best answer is C.

$3 \sim (t-1) = 3(t-1)^2 = 3(t^2 - 2t + 1) = 3t^2 - 6t + 3$ .

3. If  $Q \square = Q + 2$ , then what is the value of  $(3\square)\square$  ?

(a) 7.

- (b) 5.
- (c) 6.
- (d) 4.
- (e) 8.

The best answer is A.

$$(3r) \square = (3 + 2) \square = 5 \square = 5 + 2 = 7.$$

4. If  $(3 \square) \square = 9$ , then which of the following expressions can  $x \square$  be equal to?

- (a)  $x^2$ .
- (b)  $3x - 5$ .
- (c)  $2x - 1$ .
- (d)  $2x + 1$ .
- (e) none of the answers above.

The best answer is C.

Check the answers by replacing the  $x$  with 3 and try to see if it works out.

Answer (a):  $(3 \square) \square = (3^2)^2 = 81$ . Not good.

Answer (b):  $(3 \square) \square = (3 \times 3 - 5) \square = (4) \square = (12 - 5) = 7$ . Not good either.

Answer (c):  $(3 \square) \square = (3 \times 2 - 1) \square = (5) \square = (10 - 1) = 9$ . Good enough.

5. If  $(4 \square 2 = 14)$  and  $(2 \square 3 = 6)$ , what can replace  $(a \square b)$  ?

- (a)  $ab$ .
- (b)  $(a+3)b$
- (c)  $a^2 - b$ .
- (d)  $a^b - 2$ .
- (e)  $b^a + 1$ .

The best answer is D.

Check every answer until you hit the jackpot.

(a)  $(4 \square 2) = 8$ . The answer should be 14.

(b)  $(2 \square 3) = (2 + 3)3 = 15$ . The answer should be 6.

(c)  $(2 \square 3) = (2^2 - 3) = 1$ . The answer should be 6.

(d)  $(4 \square 2) = (4^2 - 2) = 14$ . This is the right answer, check  $(2 \square 3)$  also.

6. If  $\square(a,b) = \frac{3a}{\sqrt{b}}$ , what is the value of  $\square[\square(4,4), \square(1,9)]$  ?

- (a) 1.
- (b) 4.
- (c) 6.
- (d) 9.
- (e) 18.

The best answer is E.

Start with the inner parenthesis.

$$\square(4,4) = \frac{3 \cdot 4}{\sqrt{4}} = 6.$$

$$\square(1,9) = \frac{3 \cdot 1}{\sqrt{9}} = 1.$$

$$\square(6,1) = \frac{3 \cdot 6}{\sqrt{1}} = 18. \text{ Therefore E is the best answer.}$$

7. If  $5\square = 13$ , which of the following can describe a  $\square$ ?

(a)  $3a + 1$ .

(b)  $2a + 3$ .

(c)  $3a - 2$ .

(d)  $3a - 1$ .

(e) Answers (b) and (c).

The best answer is E.

Check each and every answer:

(a)  $5\square = 3 \times 5 + 1 = 16$ .

(b)  $5\square = 2 \times 5 + 3 = 13$ .

(c)  $5\square = 3 \times 5 - 2 = 13$ .

There is no need to check the final answer because we already know the right answer.

11. For every X, the action [X] is defined in the following matter: [X] is the greatest integer that is smaller or equal to X. For example:  $[8.9] = 8$ .

What is the value of  $[6.5] \times [2/3] + [2] \times 7.2 + [8.4] - 6.6$  ?

(a) 15.8.

(b) 16.2.

(c) 16.4.

(d) 14.4.

(e) 12.6.

The best answer is A.

$$[6.5] \times [2/3] + [2] \times 7.2 + [8.4] - 6.6 = 6 \times 0 + 2 \times 7.2 + 8 - 6.6 = 15.8.$$

15. If  $(1 < A < 3 < B)$ , then which of the following expressions is the largest?

(a)  $(B+2)/(A-1)$ .

(b)  $(B-2)/(A+1)$ .

(c)  $A/B$ .

(d)  $(B-2)/(A-1)$ .

(e)  $B/A$ .

The best answer is A.

Try some numbers and check the answers.  $A=2, B=4$ .

(a)  $6/1 = 6$ .

(b)  $2/3$ .

(c)  $1/2$ .

- (d) 2.
- (e) 2.

16. Which of the following fractions is the smallest?

- (a)  $\frac{3}{10}$ .
- (b)  $\frac{6}{19}$ .
- (c)  $\frac{3}{8}$ .
- (d)  $\frac{11}{30}$ .
- (e)  $\frac{12}{31}$ .

The best answer is A.

Compare all of the answers to (a)  $\frac{3}{10}$ .

- (b)  $\frac{3}{10} \times 2 = \frac{6}{20}$  which is smaller than  $\frac{6}{19}$ .
- (c)  $\frac{3}{10}$  is smaller.
- (d)  $\frac{3}{10} = \frac{9}{30}$ , and this is smaller than  $\frac{11}{30}$ .
- (e)  $\frac{3}{10} = \frac{12}{40}$  and that is smaller than  $\frac{12}{31}$ .

The smallest fraction is A.

17. Which of the following fractions is the largest?

- (a)  $\frac{2}{7}$ .
- (b)  $\frac{2}{3}$ .
- (c)  $\frac{7}{9}$ .
- (d)  $\frac{7}{12}$ .
- (e)  $\frac{3}{5}$ .

The best answer is C.

Lets compare all the answers to  $\frac{2}{7}$ , unless we find a larger fraction.

- (b)  $\frac{2}{3}$  is larger than  $\frac{2}{7}$ . For now, this is the right answer.
- (c)  $\frac{2}{3}$  is also  $\frac{6}{9}$  and that is smaller than  $\frac{7}{9}$ . For now this is the right answer.
- (d)  $\frac{7}{9}$  is bigger than  $\frac{7}{12}$ .
- (e) Bring this answer and (c) to a common denominator.  
 $\frac{7}{9} = \frac{35}{45}$  and  $\frac{3}{5} = \frac{27}{45}$ .  
 $\frac{7}{9}$  is the largest fraction.

19. If  $A^2 + B^2 = 15$  and  $AB = 10$ , what is the value of the expression  $(A - B)^2 + (A + B)^2$ ?

- (a) 10.
- (b) 20.
- (c) 30.
- (d) 60.
- (e) 70.

The best answer is C.

$$(A - B)^2 + (A + B)^2 = A^2 - 2AB + B^2 + A^2 + 2AB + B^2 = 2(A^2 + B^2) = 30.$$

20. If A and B are positive integers, which of the following expressions is not an integer for certain?

- (a)  $(2A^2 - 2B^2)/(A+B)$ .
- (b)  $(6B + 8A)/(3B + 4A)$ .
- (c)  $(3A - B)/(B - 3A)$ .
- (d)  $(A + B)/(A^2 + B^2 + 2AB)$ .
- (e)  $(A^2 - B^2)/(A - B)$ .

The best answer is D.

All the answers besides D are numbers after some simplification.

Answer D =  $(A + B)/(A+B)^2 = 1/(A+B)$ , and this is a fraction of a number.

21. In the “Big-Reds” parking lot there are 56 vehicles, 18 of them are buses and the rest are private cars. The color of 32 vehicles is red, from which 17 are buses. How many private cars can be found in the parking lot, which are not colored red?

- 1.
- 23.
- 17.
- 15.
- 20.

The best answer is B.

Out of 56 vehicles, 32 are colored red, therefore 24 are in different color.

17 of the red vehicles are buses, therefore  $(18 - 17 = 1)$  are in different color.

$(24 - 1 = 23)$  private cars are in the parking lot with a different color than red.

22. In Sam’s hanger there are 23 boxes, 16 out of the boxes are filled with toys and the rest are filled with electrical appliances. 8 boxes are for sale, 5 of them are filled with toys. How many boxes with electrical appliances are in Sam’s hanger that are not for sale?

- 1.
- 2.
- 3.
- 4.
- 5.

The best answer is D.

8 boxes are for sale, 5 of them are with toys, and therefore 3 of them are with electrical appliances.

Out of 23 boxes, 16 are with toys, therefore, and therefore 7 of them are with electrical appliances.

$(7 - 3 = 4)$  is the number of electrical appliances boxes, which are not for sale.

1. In the fifth grade at Parkway elementary school there are 420 students. 312 students are boys and 250 students are playing soccer. 86% of the students that play soccer are obviously boys. How many girl student are in Parkway that are not playing soccer?

- 69.
- 73.
- 81.
- 91.
- 108.

The best answer is B.

There are  $(420 - 312 = 108)$  girls in Parkway.

86% of 250 are boys, therefore 14% of 250 are girls that play soccer, which is 35 girls.

The number of girls that do not play soccer is  $(108 - 35 = 73)$ .

2. In the quiet town of “Nothintodo” there are 600 inhabitants, 400 are unemployed and 300 are somnambulists. If half of the somnambulists are unemployed, how many are employed and are not somnambulists?

- 50.
- 100.
- 150.
- 200.
- 300.

The best answer is A.

There are 300 people that are not somnambulists. There are  $(600 - 400 = 200)$  people that are employed in the town, half of the somnambulists are employed (150), therefore  $(200 - 150 = 50)$  is the number of people that are employed which are also not somnambulists.

3. In the youth summer village there are 150 people, 75 of them are not working, 50 of them have families and 100 of them like to sing in the shower. What is the largest possible number of people in the village, which are working, that doesn't have families and that are singing in the shower?

- 25.
- 50.
- 75.
- 100.
- 150.

The best answer is C.

The number of people that work is 75.

The number of people that doesn't have families is  $(150 - 50 = 100)$ .

100 of the people like to sing in the shower.

The largest possible number of people that belong to all three groups is the smallest among them, Meaning 75.

4. In the junior basketball league there are 18 teams,  $\frac{2}{3}$  of them are bad and  $\frac{1}{2}$  are rich. What can't be the number of teams that are rich and bad?

- 4.
- 6.
- 10.
- 7.
- 8.

The best answer is C.

$(\frac{2}{3} \times 18 = 12)$  teams are bad and 9 are rich.

The number of teams which are rich and that are bad must be between 9 and  $(9+12-18 = 3)$ .

The only answer, which is not in that range, is C.

5. In the third grade of Windblow School there are 108 students, one third of them failed the math test and  $\frac{1}{6}$  failed that literature test. At least how many students failed both tests?

- 0.
- 6.
- 8.
- 10.
- 12.

The best answer is A.

$(\frac{1}{3} \times 108 = 36)$  failed the math test.

$(\frac{1}{6} \times 108 = 18)$  failed that literature test.

The least amount of people that failed both tests is  $(18 + 36 - 108 = -54)$ , there cant be an negative Overlapping between the groups so the least amount of people who failed both tests is zero.

6. If  $\frac{1}{X} = 2.5$ , then what is the value of  $\frac{1}{(X - \frac{2}{3})}$ ?

- 2.25.
- 3.5.
- 3.75.
- 1.75.
- 3.75.

The best answer is C.

If  $\frac{1}{X}$  is 2.5 or  $\frac{5}{2}$  then  $X = \frac{2}{5}$ .

$\frac{1}{(\frac{2}{5} - \frac{2}{3})}$  is  $\frac{1}{(\frac{6}{15} - \frac{10}{15})} = \frac{-15}{4} = -3.75$ .

8. Travis is working as a programmer of IBW. Travis earns \$3,500 annually. If Travis pays 2.5% of that amount quarterly to support groups and he paid \$525 so far, for how many years now has Travis been paying?

- 2.
- 2.5.
- 4.
- 5.5.
- 6.

The best answer is B.

Travis pays 2.5% of 3500, which is \$87.5 every 3 months (quarterly).

$(525/87.5 = 6)$ , therefore Travis has been paying for  $(6 \times 3 = 18)$  months now, that is 2.5 years.

9. Dana borrows 5500 pounds annually for her college education. If Dana gives her parents 3% of that amount back each month, how much will she still owe her parents after four years of college?

- 12,430.
- 13,640.
- 14,000.
- 14,080.
- 15,020.

Dana takes 5500 each year and returns  $(0.03 \times 5500 = 165)$  each month, which is  $(165 \times 12 = 1980)$  each passing year. That means that each year Dana owes her parents  $(5500 - 1980 = 3520)$  pounds.

After 4 years in college she will owe them  $(4 \times 3520 = 14,080)$  pounds.

10. Mr. Rusty owes the bank \$1,040,000, he returns \$40,000 quarterly to the bank. If the tax on the money Rusty owes is compounded quarterly by 0.25% starting before Rusty paid the first payment, how months would it take poor Rusty to reach a point where he owes the bank no more than 1 million dollars?

- 3.
- 6.
- 9.
- 12.
- 15.

The best answer is B.

Every three months Rusty gives the bank \$40,000.

After the first quarter the bank took  $(0.0025 \times 1040000 = 2600)$  and Rusty paid \$40,000 so the new

Debt is now  $(1,040,000 - 40,000 + 2,600 = 1,002,600)$ .

After the second quarter the bank took ( $0.0025 \times 1002600 = 2506.5$ ) and Rusty paid again \$40,000 so the new Debt is now ( $1,002,600 - 40,000 + 2506.5 < 1$  million dollars).

11. Simba borrowed \$12,000 from his brothers so he can buy a new sports car. If Simba returns 4.5% of that amount every 2 weeks, after how many months Simba wouldn't owe his brothers any more money?

- 8.
- 12.
- 15.
- 18.
- 20.

The best answer is B.

Simba gives ( $0.045 \times 12,000 = 540$ ) to his brothers every 2 weeks, in a month he gives ( $540 \times 2 = 1080$ ). ( $12,000/1,080$  is a little over 11), therefore after 12 months he won't owe any more money.

12. If A and B are two roots of the equation  $X^2 - 6.5X - 17$ , then what is the value of A x B?

- 15.
- 18.
- 16.5.
- 17.
- 22.

The best answer is D.

The roots of the equation are 8.5 and (-2).

The multiplication of the roots is equal to (-17).

13. If A,B and C are roots of the equation  $X^3 - 16X^2 + 48X$ , what is the sum of the roots?

- 16.
- 14.
- 17.
- 18.5.
- 22.5.

The best answer is A.

The equation can be written as:  $X(X^2 - 16X + 48) = X(X - 12)(X - 4)$ .

The roots of the equation are: 0,4 and 12. The sum of the roots is 16.

14. If R is a root of the equation  $X^2 + 3X - 54$ , then which of the following equations have also the root R ?

$$X^2 - 12X + 27.$$

$$X^2 - 6X - 16.$$

$$X^2 - 10X - 31.25.$$

$$X^2 - 15X + 54.$$

$$X^2 + 10X + 16.$$

The best answer is D.

The original equation is  $X^2 + 3X - 54$ , it can be written as  $(X - 6)(X + 9)$ . The roots are 6 and (-9).

We are looking for an equation that has one of the same roots.

Answer D:  $X^2 - 15X + 54 = (X - 6)(X - 9) \rightarrow$  This equation has the root 6.

All the other answers have different roots than the original equation.

15. If P is a root of the equation  $X^3 + 10X^2 + 16X$ , then which of the following equations have also the root P ?

$$X^2 - 10X + 16.$$

$$X + 8.$$

$$X^2 + 3X - 54.$$

$$X^2 - 6X - 187.$$

$$X^2 + 8X - 20.$$

The best answer is B.

The original equation is  $X^3 + 10X^2 + 16X$ , it can be written as  $X(X + 8)(X + 2)$ . The roots are

(-8), 0 and (-2).

We are looking for an equation that has one of the same roots.

Answer B:  $X + 8 \rightarrow$  This equation has the root (-8).

All the other answers have different roots than the original equation.

16. If X is a root of the equation  $a^3 + 8a^2 - 20a$ , then which of the following equations Don't have the root X as one of their roots?

$$X^3 + 4X^2 - 32X.$$

$$X^2 + 18X + 80.$$

$$X^2 - 12X + 20.$$

$$X^2 + 5X - 14.$$

$$X^2 + 10X + 16.$$

The best answer is E.

The original equation is  $a^3 + 8a^2 - 20a$ , it can be written as  $a(a - 2)(X + 10)$ . The roots are 2, 0 and (-10).

We are looking for an equation that has none of the same roots.

Answer E:  $X^2 - 10X + 16 = (X + 2)(X + 8) \rightarrow$  This equation has none of the original roots. All the other answers have one or more of the same original roots.

17. Gwen has to divide her money between her three sons. If the older brother received 65% of the total amount and the other two received the same amount of money, how much money did the median brother get?

(1) The combined amount of money of the older brother and the small one is \$45,000.

(2) The older brother received \$35,454.5.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

The data gave us the ratio of the amounts each one got (65 : 17.5 : 17.5), therefore all we need is one number to know how much each of the brothers received. Each of the statements above gives us enough information to solve the problem.

18. Little Timmy spends half of his allowance on his favorite pet Din and the other half on candies. How much money did Timmy spend on Din?

(1) Din eats 1.5Kg of food every day.

(2) Timmy buys 110 gr. Of candies each day. One Kg of candies costs \$7.5.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

From the question we know the ratio of the money that Timmy is spending on Din and on candies.

In order to know how much Timmy spends on each, we need to know one of the expenses in real

Amount of money and not in percent terms. The first statement doesn't provide us any sufficient information but the second one gives us the exact amount of money that Timmy spends on Candies, which is equal to the amount that he spends on Din.

19. A, B, C and D are four consecutive points on a straight line. What is the distance between A to D?

(1)  $AC = 6$ .

(2)  $BD = 8$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

First, draw the line with the points marked.

We know AC and BD but it's not sufficient to know the length of AD.

If the question said the points are evenly spaced then the answer would be solvable.

20. A, B, C, D and E are five consecutive points with equal spacing on a straight line. What is the distance between A to E?

(1)  $AB = 3$ .

(2)  $BE = 9$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

First, draw the line with the points marked.

Because the points are evenly spaced on the straight line, only one measurement is needed to answer the question. Both statements give us a measurement of some kind therefore each of them, by itself is sufficient.

21. A, B and C are 3 consecutive points on an arc with a constant radius. What is the distance between A and C?

(1) The radius of the arc is 25 Cm.

(2) The length of AB is 5 Cm.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

In order to know the distance between two points on an arc you need to know the angle that the points make and the radius of the arc.

Statement (1) gives us the radius.

Statement (2) gives us the length of AB, but the question didn't mention that there is equal spacing and therefore the length of BC can't be found with both of the statements taken together.

23. If  $X$  and  $Y$  are positive integers, is  $X$  greater than  $Y$ ?

(1)  $X > Y - 2$ .

(2)  $X > 2$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Take some numbers for example.

$Y = 8 \rightarrow$  from statement (1) we know that  $X > 6$  and from statement (2) we know that  $X > 2$ , but  $X$  can be 7 or even 24 and he will still fit the equation properly, therefore both statements, taken together are not sufficient.

24. If  $X$  and  $Y$  are positive integers, is  $X$  greater than  $Y$ ?

(1)  $X > 2$ .

(2)  $Y < 3$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From statement (1) we learn that X is 3 or bigger and from statement (2) we learn that Y is 2 or smaller. Therefore both statements are sufficient to answer the question.

25. If X, Y and Z are positive integers, is X greater than Z – Y?

(1)  $X - Z - Y > 0$ .

(2)  $Z^2 = X^2 + Y^2$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

From statement (1) we learn that  $X > Z + Y$  therefore X must be bigger than Z – Y (positive integers).

From statement (2) we learn that  $X^2 = Z^2 - Y^2$  and that tells us nothing relevant.

26. (x, y) are the coordinates of the intersection of the following lines:

$(3x - 2y = 8)$  and  $(3y + x = 10)$ . What is the value of (x/y)?

- 1.
- 2.
- 3.
- 4.
- 5.

The best answer is B.

There is no need to draw the lines. There are two equations with two variable that you have to solve.

Take the second equation and multiply it by (-3) to get:  $-9y - 3x = -30$  add this equation to the first and

You'll get:  $-11y = -22 \rightarrow y=2$  and  $x=4$ . (x/y) is 2.

27. A(a, b) is the coordinates of the intersection between the lines:  $(x + y - 1 = 0)$  and  $(4x - 2y = 5)$ . What is the shortest distance between A(a, b) and the coordinate B(25/6, 23/6)?

- 1.
- 2.
- 3.
- 4.
- 5.

The best answer is E.

There is no need to draw the two lines. Multiply equation (1) by 2 and then add the equations to get:

$$6x = 7 \rightarrow x = 7/6, y = -1/6.$$

Draw a rectangular axis system and mark the point A and B.

Complete the two points to a triangle so one of sides is 3 and the other is 4, the hypotenuse, which is also the requested length is 5.

28. P(x, y) is the intersection point between the circle  $(x^2 + y^2 = 4)$  and the line  $(y = x + 2)$ . Which of the following can be the point P?

- (1, 2).
- (2, 0).
- (0, -2).
- (-2, 0).
- (2, 2).

The best answer is D.

First, draw the circle and the line. The circle is centered at (0, 0) with a radius of 2.

You can see that the line and the circle intersect at two points: (-2, 0) and

(0, 2). Another way is to insert  $y = x + 2$  into the equation of the circle and solve it.

29. Is the intersection of the two lines:  $(x + y = 8)$  and  $(4y - 4x = 16)$  inside the circle:  $x^2 + y^2 = r^2$ ?

(1)  $r = 81$ .

(2) The center of the circle is at the coordinate (-99, -99).

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

The intersection point of the two lines is easy to find, its (2, 6).

In order for us to know if the point is inside the circle we need to know the exact location of the circle. Statement (1) clears the problem by giving us the radius so all the sufficient data is known.

Statement (2) is not sufficient because it tells us nothing about the radius of the circle.

30. Is there an intersection between the line ( $Y = aX - b$ ) and the parabola ( $Y = X^2 + b$ )?

(1)  $a < 0$ .

(2)  $0 > b$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

First, draw the parabola and the line.

We can see that the thing that determines if the two intersect is  $b$  and not  $a$ .

If  $b > 0$  there is no intersection but if  $b < 0$  there is an intersection no matter what the value of  $a$  is.

Therefore statement (2) is sufficient and (1) is not.

31. Is there a point of intersection between the circle ( $X^2 + Y^2 = 4$ ) and the Line ( $Y = aX + b$ ) ?

(1)  $a = b^2$ .

(2) The line intersects the X-axis at (40, 0).

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From statement (1) we learn that the equation of the line can be written as  $Y = b^2X + b$ .

From statement (2) we learn that the line goes through the point (40, 0), from that we can find the equation of the line by plugging the coordinate in the equation:  $0 = b^2(40) + b$ .

There is no need to solve it, both statements are sufficient to solve the problem.

32. Zigfield bought his car using  $M\%$  of his bank savings. He also bought a house that costs 4 times the price of the car. What is the price of the house?

(1)  $M = 12$ .

(2) The price of the car and the house was \$140,000.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

With statement (1) we know that the car cost 12% of his life savings.

From statement (1) and (2) we know that  $(12 \times 4 = 48)$  percent of his life savings went to the house. 60% of his life savings is \$140,000. From here we know how much

were his life savings and so we know that 48% of that went to the house. Both statements are needed.

33. Eddy gave  $Q\%$  of the money he earned last year to his first wife Sandra,  $W\%$  of the money he earned last year went to his second wife Tawana. How much money did Eddy earn this year?

(1)  $Q = 20$ ,  $W = 2Q$ .

(2) All the money Eddy earned last year went to his two wives.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

From statement (1) and (2) taken together we know how much Eddy earned last year but we know

Nothing about this year, we have no connections between them. Therefore, both statements are not sufficient to answer the question.

34. Of the 10,000 people that went to the state-fair, how many men ate at the fair?

(1) The percentage of men who ate at the state-fair was twice as those who didn't eat.

(2) 3,500 women ate at the state-fair.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

From statement (1) we know the ratio between the men who ate to those who didn't, but we don't know how many men were at the fair. Statement (2) doesn't reveal the number of woman that went to the fair, only the number of woman that ate there. Therefore, more data is needed to answer the question.

35. Out of the 100 kids that went to the party, how many girls danced there?

(1) 25 girls don't like to dance and so they didn't.

(2) The number of boys that danced is twice the number that didn't dance.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

From statement (1) we know that 25 out of X girls didn't dance. We need to know how many girls in total were in the party. Statement (2) doesn't tell us anything about the number of boys or girls that went to the party but only the ratio between those who danced to those who didn't.

Therefore, more sufficient data is needed to solve the problem.

36. 990 people went to the GMAT exam, how many boys didn't pass the test?

(1) 321 girls didn't pass the test, which is the number of boys that did.

(2) One fifth of the people that went to the GMAT exam were boys who eventually didn't pass the test.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

Statement (1) gives us information about the number of boys that passed the test but no useful information about the other part of the boys.

Statement (2) by itself gives us the answer to the question ( $\frac{1}{5} \times 990$ ).

Therefore, the answer is B.

37. What is the area of the rectangle with the following coordinates:  $(x, y)$ ,  $(10, y)$ ,  $(10, 5)$ ,  $(x, 5)$ ?

6.

8.

12.

32.

It cannot be determined from the information given.

The best answer is E.

First of all, draw the rectangle with the given coordinates.

You can see that only one side of the rectangle is given and not the second, therefore there isn't enough data to answer the question.

38. What is the area of the square with the following coordinates:  $(x, y)$ ,  $(20, 20)$ ,  $(20, 5)$ ,  $(x, 5)$ ?

60.

85.

125.

225.

It cannot be determined from the information given.

The best answer is D.

First of all, draw the square with the given coordinates.

We know only one of the square's sides but it's enough because it is a square and both sides are equal. The area, therefore, is  $(15 \times 15 = 225)$ .

39. Is the largest of 7 consecutive numbers odd?

(1) The product of the seven numbers is zero.

(2) The sum of the seven numbers is zero.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

From statement (1) we learn that there is a 0 among the seven numbers, yet the largest number can be odd or even. (0, 1, 2, 3, 4, 5, 6 or -1, 0, 1, 2, 3, 4, 5).

From statement (2) we know that the numbers are located symmetrically around the zero, therefore the largest number is even.

40. Is the sum of X consecutive numbers zero?

(1) The largest number is 5.

(2) The median number is zero.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

Statement (1) is not sufficient because the series of numbers is not blocked from the smaller numbers.

Statement (2) is sufficient by itself because we know that if the median number is 0, then the sum of the numbers must be even.

2. If X and Y are positive integers, what is the ratio between Y and X?

(1)  $XY = 150$ .

(2) Y is 22% of X.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

The question actually asks what is  $Y/X$  or  $X/Y$ .

Statement (1) is not sufficient because from the product of the two variables we can't make out the ratio. Statement (2) is sufficient by itself,  $Y = 22X/100 \rightarrow Y/X = 11/50$ . Therefore the answer is B.

3. If x and y are positive integers ( $x > y$ ), what is the units' digit of  $(10^x - 9^y)^2$ ?

9.

7.

5.

3.

1.

The best answer is E.

Try some numbers,  $x=2, y=1$ .

$(10^2 - 9^1)^2 = 81$ . And it will work with any given number under the conditions given.

4. What is the value of  $A + B$  ?

(1)  $A = 8 - B$ .

(2)  $(A + B)^2 - 64 = 0$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

From statement (1) we know right away that  $A + B = 8$ .

From statement (2) we don't know if  $A + B = 8$  or  $-8$ .

Therefore only statement one is sufficient to answer the question.

5. What is the value of  $(A - B)$ ?

(1)  $A = 8 - B$ .

(2)  $A^2 - B^2 - 64 = 0$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From statement (1) we know the value of  $A + B$ .

From statement (2) we know the value of  $A^2 - B^2 = (A - B)(A + B) \rightarrow (A - B)8 = 64$   
 $\rightarrow$  the answer is equal to 8, therefore both statements are needed on order to answer the question.

6. What is the value of  $(A + B)$  ?

(1)  $B = 12 - 3B$ .

(2)  $A^2 + 4A - 16 = 0$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

From statement (1) we can find the exact value of B.

From statement (2), we can find two answers for variable A, therefore the answer is not unequivocally and both statements taken together are not enough, more sufficient data is needed.

7. What is the value of  $(X^2 + Y^2)$ ?

(1)  $(X - Y)^2 = 36$ .

(2)  $(X + Y)^2 = 48$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Statement (1) can be written as  $X^2 - 2XY + Y^2 = 36$ .

Statement (2) can be written as  $X^2 + 2XY + Y^2 = 48$ .

Adding both equations will give:  $2X^2 + 2Y^2 = 84 \rightarrow X^2 + Y^2 = 42$ .

Therefore, both statements are needed in order to solve the question.

8. There are X dogs in the dog hound, each dog eats Y Kg of food every day. What percent of the total food weight does each dog eat?

(1) If there were 3 dogs less then each dog could eat 1.2 Kg more than he is does now.

(2) If there were half the dogs, each dog could eat 3 Kg more than he is does now.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

In order to know the answer we need two equations:

From statement (1) we can write:  $XY = (X - 3)(Y + 1.2)$ .

From statement (2) we can write:  $XY = (X/2)(Y + 3)$ .

You don't need to solve the equations, the answer is C, both equations are needed to solve the question.

9. If  $(R, R^2 + 1)$  is the  $(x, y)$  coordinate of a point located on the line:  $Y = 2X + 4$ , what Can be the value of the parameter R?

-3.

2.

4.

3.

1.

The best answer is D.

If the point is on the line then you can plug the coordinate into the equation.

$Y = 2X + 4 \rightarrow R^2 + 1 = 2R + 4 \rightarrow R = 3$  or  $R = -1$ .

Therefore the best answer is D.

10. A(5,  $w^3$ ) is the (x, y) coordinate of point located on the parabola  $Y = X^2 + 2$ .  
What is the value of w?

- 3.
- 4.
- 5.
- 6.
- 9.

The best answer is A.

Plug into the equation the coordinate to get:  $w^3 = 5^2 + 2 = 27 \rightarrow w = 3$ .

11. If x and y are positive integers, is  $5^x(1/4)^y < 1$  ?

(1)  $y = 3x$ .

(2)  $x = 2$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

Use statement (1) to write:  $5^x(1/4)^{3x} = (5/64)^x$ . Because x is a positive integer only, the expression will always be smaller than 1. This statement alone provides us the answer.

Use statement (2) to write:  $5^2(1/4)^y \rightarrow$  the answer here is dependent on y, a different combinations of the variable y will give different results.

Therefore the answer is A.

12. If  $x$  and  $y$  are integers, is  $3^x(0.5)^y < 1$  ?

(1)  $y = 2x$ .

(2)  $x = 8$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Use statement (1) to write the expression:  $3^x(0.5)^{2x} = (0.75)^x \rightarrow$  the value of this expression can be either smaller or larger than 1, if  $x$  was only a positive integer the answer would be distinct.

Use statement (2) alone to write the expression:  $3^8(0.5)^y \rightarrow$  this expression is either bigger or smaller than 1.

Use both statements together:  $(0.75)^8 < 1$ . Therefore both statements are needed to answer the question.

13.  $A$  and  $B$  are integers, is  $(0.5)^{AB} > 1$  ?

(1)  $A$  is positive integer and  $B$  is negative integer.

(2)  $A$  and  $B$  are two consecutive numbers.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

From statement (1) we know that one is positive and the other is negative, therefore their product is negative.  $(0.5)^{\text{negative}} = \text{a number bigger than 1}$ . This statement is sufficient to answer the question.

From statement (2) we know the answer also. This is a tricky part.

Try all the options: (-2 and -1), (-1 and 0), (0 and 1), (1 and 2).

All of these options give out AB that is positive or equal to zero, in both cases  $(0.5)^{\text{AB}}$  will be either smaller than 1 or equal to 1 but never bigger. Therefore each statement by itself is sufficient.

14. A jar of 264 marbles is divided equally among a group of marble-players. If 2 people join the group, each one would receive 1 marble less. How many people are there in the group today?

- 20.
- 21.
- 22.
- 23.
- 24.

The best answer is C.

You can back-solve it. 264 marbles divided by 22 (answer C) is 12 marbles per person.

If two people join, there will be 24 people,  $264/24$  is 11, which is 1 marble less.

15. A basket of 1430 apples is divided equally among a group of apple lovers. If 45 people join the group, each apple lover would receive 9 apples less. How many apples did each person get before 45 people joined the feast?

- 20.
- 21.
- 22.
- 23.
- 24.

The best answer is C.

Try to back-solve the problem.  $(1430/22 = 65)$  people, if 45 came then there are 110 people.

$(1430/110 = 13)$  apples, which is 9 apples less per person.

16. A confectioner decides to sell all of his pastry due to the coming holiday. His pastry goods are equally divided among a group of 28 regular customers. If only 49 customers come to the bakery, each one will receive 6 less pastry goods. How much pastry does the confectioner need to sell?

- 392.
- 412.

- 432.
- 502.
- 522.

The best answer is A.

You can use the answers to back-solve the question or you could write the equations. Take 392 pastry goods and divide them by 28 customers, each one will receive 14 products.

If there were 49 customers, each one would receive  $(392/49 = 8)$ , which is 6 less.

17. In the equation  $4Y - 3kX = 18$ ,  $k$  is a constant and  $Y$  equals 42 when  $X$  equals 12. What is the approximate value of  $X$  when  $Y$  equals 36?

- 5.
- 10.
- 15.
- 20.
- 25.

The best answer is B.

First, find the constant  $k$ . Plug in the numbers for  $X$  and  $Y$ , to receive  $4 \times 42 - 3k \times 12 = 18 \rightarrow$

$$k = (18 - 168)/36 = -25/6.$$

Now, plug in the value of  $Y$  to receive:  $4 \times 36 - 3kX = 18 \rightarrow$  after a little math,  $X$  is equal to 10.08, therefore the approximate answer is 10.

18. In the equation  $(X + Y = k)$ ,  $k$  is a constant and  $X$  equals 13 when  $Y$  equals 23.5. What can be the value of  $X^2$  when  $Y^2$  is equal to 36?

- 456.5.
- 673.25.
- 830.75.
- 890.35.
- 930.25.

The best answer is E.

First, find the constant  $k$ . Plug in the numbers to get  $k = 13 + 23.5 = 36.5$ .

Now,  $Y^2 = 36 \rightarrow Y = 6$  or  $(-6)$ . Plug both numbers to get  $X = 30.5$  or  $X = 42.5$ .

The best answer is E,  $(30.5)^2 = 930.25$ .

19. Did the owner of the garage sale made more than \$130 last Saturday?

(1) There were 15 products at the garage sale, each one cost \$25.

(2) All the products were sold.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Statement (1) tells us how many products were in the sale and how much did each cost.

Statement (2) tells us that all the products were sold, therefore the owner made  $15 \times \$25 = \$375$ .

Both statements are required to answer the question.

20. What is the total amount of Jellybeans that Benjamin ate last week?

(1) This week Benjamin ate 20% more Jellybeans than two weeks ago.

(2) Two weeks ago Benjamin ate 65 Jellybeans.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Statement (1) gives us information about this week and two weeks ago, statement (2) also doesn't give us any sufficient data on last week, but on two weeks ago.

Therefore, more sufficient data is required.

21. How many hamburgers did “Wacdonalds” sell last year?

(1) Two years ago “Wacdonalds” sold 422,000,000 hamburgers.

(2) The average amount of hamburgers sold by “Wacdonalds” each year is 5 million.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Statement (1) gives us data on the sales of two years ago.

Statement (2) gives us data on the average amount of sales each year.

We can't assume that the sales two years ago + last year's sales divided by two is the average amount of sales, therefore more sufficient data is needed to answer the question.

22. At the end of the year 2002, Monica and Chandler each purchased a certificate of deposit that paid the same rate of interest, and each held the certificate of deposit through the end of 2002. If Chandler invested  $X$  dollars and Monica invested \$130,000, and if Chandler earned interest in 2002 totaling \$45,000, what was the amount of interest that Monica earned on her \$130,000 investment?

(1) The rate of interest on the certificate of deposit that Chandler and Monica each purchased was 8.5% annually.

(2) In 2002, Chandler invested \$529,412 in the certificate of deposit.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

From statement (1) we know the rate of interest, so we can easily calculate how much Monica earned with her \$130,000 deposit.

From statement (2) we know how much Chandler invested and we already know from the question how much he earned, we can calculate the interest and multiply it by the deposit that Monica made.

Therefore, both statements, by themselves, are sufficient to answer the question.

23. Mickey made an  $X$  dollars loan at the beginning of 1996. Travis, who is Mickey's little brother also made a loan, only twice as large as Mickey's but with the same interest. If Travis pays \$10,000 interest on his loan each year, how big is Mickey's loan?

(1) The rate of interest on the loan that Travis took is 6% annually.

(2) The loan that Travis made was \$166,667.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

From statement (1) we know the rate of interest so we can find how much money Travis loaned and multiply it by 2 to get Mickey's loan.

From statement (2) we know the amount Travis loaned, which is doubled than that of Mickey.

Therefore, both statements, by themselves, are sufficient to answer the question.

25. Concentrated orange juice comes inside a cylinder tube with a radius of 2.5 inches and a height of 15 inches. The tubes are packed into wooden boxes, each with dimensions of 11 inches by 10 inches by 31 inches. How many tubes of concentrated orange juice, at the most, can fit into 3 wooden boxes?

24.

- 28.
- 36.
- 42.
- 48.

The best answer is A.

You want to waste as little amount of space as possible, therefore make the height of the box 11 and fit 4 boxes at the bottom so you lose only 1 inch of margin at the top and on one of the sides.

You can see that 8 tubes can fit into one box thus 24 tubes fit into 3 boxes.

1. A certain car's price decreased by 2.5% (from the original price) each year from 1996 to 2002, during that time the owner of the car invested in a new carburetor and a new audio system for the car, which increased her price by \$1,500. If the price of the car in 1996 was \$22,000, what is the car's price in 2002?

- \$18,400
- \$19,500
- \$20,200
- \$20,400
- \$21,100

The best answer is C.

The price of the car decreased by 2.5% every year on a course of 6 years. That means that the price of the car in 2002 is 15% lower than the original + \$1500 of new investments.

The new price is  $(\$22,000 \times 0.85 = 18,700 + 1500 = \$20,200)$ .

2. The average price of an antique car increases over the years. If from 1990 to 1996, the price of the car increased by 13% and from 1996 to 2001 it increased by 20%, what is the price of the car in 2001 if the price in 1990 was \$11,500?

- \$15,594.
- \$15,322.
- \$14,786.
- \$14,543.
- \$12,988.

The best answer is A.

The price in 1990 was 11,500. In 1996 the price is  $(11,500 \times 1.13 = 12,995)$ .

The price we are looking for, in 2002, is  $(12,995 \times 1.2 = \$15,594)$ .

3. The apartment on King-Williams street is an asset that it's value is tramping about. From the year 1973 to 1983 it's value decreased by 16% and from 1983 to 1993 it's value increased by 16%. What is the value of the asset in 1993 if in 1973 it was worth \$40,000?

- \$38,796.
- \$40,000.
- \$38,976.
- \$39,679.

\$36,796.

The best answer is C.

Be careful, the value of the asset didn't stay the same after the two changes in the value.

In the first 10 years, the value decreased by 16% ( $40,000 \times 0.84 = 33,600$ ).

Then, in the next ten years the value increased by 16% ( $33,600 \times 1.16 = 38,976$ ).

Therefore the answer is C.

4. The value of a "Tin-Rin" stock in the stock market decreased by 15% in the last two years.

The economic experts believe that the value of the stock will increase by 7% during the following year, which will make the value \$440. What was the approximate price of the stock two years ago?

\$473.

\$464.

\$455.

\$445.

\$430.

The best answer is A.

Start from the top, after a 7% increase the price of the stock is \$440.

440 are 107% of the price this year  $\rightarrow (440/107 \times 100 = 411.215)$ .

Two years ago the price was 15% higher, therefore ( $411.215 \times 1.15$ ) is approximately \$473.

5. Which of the following expressions is equivalent to  $|X| < 4$  ?

$X < 4$ .

$X > 4$ .

$X > -4$ .

$4 < X < -4$ .

$-4 < X < 4$ .

The best answer is E.

An absolute value means that the sign of the variable is insignificant, therefore X can be between -4 and 4 and still he will fulfill the original equation.

6. Which of the following statements is equivalent to  $(8 + 2X < 18 - 6X < 23 + 2X)$  ?

$4/5 < X < 2.5$ .

$4/5 < X < 8/5$ .

$-5/8 < X < 5/4$ .

$2.5 < X < 3.5$ .

$5 < 8X < 12$ .

The best answer is C.

Take the expression and simplify it: Take  $(8 + 2x)$  from each side to get:  $(0 < 10 - 8X < 15)$ .

Substitute 10,  $-10 < -8X < 5$ .

Divide all by  $(-8)$ ,  $5/4 > X > -5/8$ . Therefore the answer is C.

7. At the faculty of Aerospace Engineering, 312 students study Random-processing methods, 232 students study Scramjet rocket engines and 112 students study them both. If every student in the faculty has to study one of the two subjects, how many students are there in the faculty of Aerospace Engineering?

424.

428.

430.

432.

436.

The best answer is D.

Use the group formula.

Total = group<sub>A</sub> + group<sub>B</sub> - Both + Neither.

Total =  $312 + 232 - 112 + 0 = 432$  students.

8. In the faculty of Reverse-Engineering, 226 second year students study numeric methods, 423 second year students study automatic control of airborne vehicles and 134 second year students study them both. How many students are there in the faculty if the second year students are approximately 80% of the total?

515.

545.

618.

644.

666.

The best answer is D.

Use the group formula.

Total = group<sub>A</sub> + group<sub>B</sub> - Both + Neither.

Total =  $226 + 423 - 134 + 0 = 515$  second year students.

The second year students are 80% of the total amount, therefore  $(515/80 \times 100 = 643.75)$ .

The best answer is D.

9. In the Biotechnology class of 2000, there were X graduates. 32 of the graduates found a job, 45 continued on to their second degree and 13 did both. If only 9 people didn't do both, What is X equal to?

69.

71.

73.

75.

76.

The best answer is C.

Use the group formula.

Total = group<sub>A</sub> + group<sub>B</sub> - Both + Neither.

Total = 32 + 45 - 13 + 9 = 73 graduates.

10. If a, b, c, d and e are distinct integers, which one is the median?

(1)  $a < b - c$ .

(2)  $d > e$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Statement (1) tells us nothing about e and d, you can eliminate answers (a) and (d).

Statement (2) tells us nothing about a, b and c, you can eliminate answer (b).

Try to plug in some numbers, take:  $a=3$ ,  $b=7$ ,  $c=1$ ,  $d=9$  and  $e=8$ . The median in that case is 7.

Try other numbers,  $a=8$ ,  $b=15$ ,  $c=6$ ,  $d=10$  and  $e=9$ . The median is 9.

First the median was b, then the median was e. More sufficient data is required to answer the question.

11. a, b and c are three odd and different integers. Which one is the median?

(1) a, b and c are consecutive numbers.

(2)  $c > a$  and  $b < c$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

From statement (1) we can learn that if they are consecutive numbers, the median is B.

From statement (2) we have a connection between c to a and b, but we don't know if a or b is the smallest among the three, therefore this statement, by itself, is not sufficient.

12. What is the ratio between W and Q?

(1)  $Q + W = 23$ .

(2) W is 25% of Q.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

We are looking for  $Q/W$ . From statement (1) we know the sum of the two variables, which is not helpful in our case. From statement (2) we know that  $W = (0.25)Q$ , therefore we know the ratio between the two variables.

13. What is the product of X and Y?

(1)  $2X + 2Y = 46$ .

(2)  $(X + Y)^2 = (X - Y)^2 + 8$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

The product of X and Y is XY.

Statement (1) implies only about their sum.

Statement (2) can be written as:  $X^2 + 2XY + Y^2 = X^2 - 2XY + Y^2 + 8 \rightarrow 4XY = 8 \rightarrow XY = 2$ .

Only statement (2) is sufficient.

20. Kramer can pack X boxes of cigarettes per minute. If there are Y boxes of cigarettes in one case, How many cases can Kramer pack in 2 hours?

60X/Y.

120X/Y.

60Y/X.

120Y/X.

$(X + Y)/60$ .

The best answer is B.

Y/X is the time it takes Kramer to fill a case with boxes (in minutes).

In two hours there are 120 minutes, so  $120/(Y/X)$  is  $120X/Y$ , and that is the number of cases that Kramer can fill in two hours.

21. George can fill Q cans of paint in 3 minutes. If there are R cans of paint in one gallon, how many gallons can George fill in 45 minutes?

30R/Q.

15R/Q.

30Q/R.

5Q/R.

15Q/R.

The best answer is E.

George can fill  $Q/3$  cans of paint in one minute  $\rightarrow$  There are  $R$  cans in one gallon, so  $R/(Q/3) = 3R/Q$   
Is the time it takes George to fill one gallon (in minutes).  
In 45 minutes George can fill up  $45/(3R/Q) = 15Q/R$ .

23. The junior soccer team is one of the best teams in the state of Alabama. The season is divided into two parts, each part is 4 months. In the first part of the season, the junior soccer team won half of their 32 games. How many games did the team win in the entire season?

(1) In the second part of the season, the team lost 9 games, tied 6 games and won 18 games.

(2) From the 32 games remaining the team won twice as much as she lost.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

From statement (1) we can complete the missing data, in the first part of the season the team won 16 games and on the second part of the season, the team won 18 games. This statement is sufficient enough to answer the question.

Statement (2) is not sufficient by itself, it doesn't mention how many games were tied, therefore only statement (1) is sufficient.

24. "Queens" is a game of cards that distinguishes the cards into three groups: reds, blacks and jokers. Four packets of cards are shuffled and only 50 cards are drawn out. How many red cards are in the stack of the 50 cards?

(1) The number of black cards is twice the number of red cards.

(2) There is at least one joker in the stack of cards.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d)Either statement BY ITSELF is sufficient to answer the question.

(e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Statement (1) implies that if we knew the number of jokers, the answer would be clear: take the cards that are not jokers and divide them by 3 to get the number of red cards.

Statement (2) is not clear enough, the number of jokers is not distinct, therefore more data is needed and the two statements taken together are not sufficient.

25. Ron has three kinds of shirts in his closet, white shirts, black shirts and fancy shirts.

What is the ratio between the shirts in the closet?

(1) The total number of shirts is 100.

(2) 30% of the shirts are black, which is twice as much as the fancy shirts.

(a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d)Either statement BY ITSELF is sufficient to answer the question.

(e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From statement (1) we know the total amount of shirts in the closet.

Statement (2) gives us the ratio between the shirts.

30% of the shirts are black (which is 30 shirts), this number is twice as much as the fancy shirts (15).

The remaining shirts must be white. We know the ratio; therefore both statements are required in order to answer the question correctly.

28. The roof of an apartment building is rectangular and its length is 4 times longer than its width. If the area of the roof is 784 feet squared, what is the difference between the length and the width of the roof?

- 38.
- 40.
- 42.
- 44.
- 46.

The best answer is C.

The area of a rectangle is (length) x (width), let X be the width of the roof  $\rightarrow 4X^2 = 784 \rightarrow$

$$X^2 = 196 \rightarrow X = 14.$$

The width of the roof is 14 and the length is 56. The difference is  $(56-14 = 42)$ .

29. The length of a cube is three times its width and half of its height. If the volume of the

Cube is 13,122 Cm cubed. What is the height of the cube?

- 49.
- 50.
- 54.
- 68.
- 81.

The best answer is C.

Normalize each dimension to the width of the cube (W).

The length is 3 times the width, therefore its 3W, which is half of the height (6W).

The volume of the cube is  $13,122 = 6W \times 3W \times W = 18W^3 \rightarrow W^3 = 729 \rightarrow W = 9$ .

The height of the cube is six times the width, therefore its 54 meters.

30. The width of a cube is half the length and one third of the height. If the length of the cube is 4 meters, what is the volume of three identical cubes?

- 96.
- 88.
- 74.
- 68.
- 62.

The best answer is A.

Normalize all the dimensions to the width. Let the width be X.

The length is twice the width, thus 2X.

The height is 3 times the width, thus 3X.

The volume of the cube is  $X \cdot 2X \cdot 3X = 6X^3$ .

The length is equal to 4  $\rightarrow 2X = 4 \rightarrow X = 2 \rightarrow \text{Volume} = 6 \times 8 = 48$ .

The volume of two cubes will be 96.

1. Two brothers took the GMAT exam, the higher score is  $X$  and the lower one is  $Y$ . If the difference between the two scores is equal to their average, what is the value of  $Y/X$  ?

- (a) 3.
- (b) 2.
- (c)  $\frac{1}{2}$ .
- (d)  $\frac{1}{3}$ .
- (e) There isn't enough data to answer the question.

The best answer is D.

If the difference is equal to the average, then we could write the equation:  $X - Y = (X + Y)/2$ .

$$\rightarrow X - 3Y = 0 \rightarrow Y/X = 1/3.$$

2. Two people measure each other's height, the height of the taller person is  $H$  and the height of the other person is  $L$ . If the differences in their height is equal to their average height, what is the Value of  $H/L$  ?

- $\frac{1}{3}$ .
- $\frac{1}{2}$ .
- 2.
- 3.
- 6.

The best answer is D.

If the difference is equal to the average, then we could write the equation:  $H - L = (H+L)/2$ .

$$\rightarrow H - 3L = 0 \rightarrow H/L = 3.$$

8. If building  $X$  is less than 40 store's high, is building  $Y$  taller than  $X$ ?

(1) Building  $Y$  is at least three times as high as building  $X$ .

(2) On the fortieth floor of the  $Y$  building there is a gift shop.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

Statement (1) tells us clearly that the Y building is taller than the X one.

Statement (2) implies that there is a gift shop on the 40<sup>th</sup> floor; therefore there are at least 40 floors on the Y building, which make it taller than X.

Both statements, by themselves, are sufficient enough to answer the question.

9. There are two major statues in Tasmanian County; the first is no more than 45 meters high. How tall is the second statue?

(1) The second statue is 10 meters higher than the first statue.

(2) Both statues together are 80 meters high.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

The information on the first statue in the question is confusing and irrelevant.

Statement (1) tells us that:  $B = A + 10$  (A is the first and B is the second statue).

Statement (2) tells us that:  $A + B = 80$ , therefore we have two equations with two variables and so we can solve the problem.

Therefore, both statements are required in order to answer the question.

10. Tower X is smaller than tower Z. Is tower Y bigger than tower X?

(1) Tower Z higher than tower Y.

(2) Tower Y is one of the tallest in the world.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d)Either statement BY ITSELF is sufficient to answer the question.

(e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

We can write the data that is given to us:  $X < Z$ .

From statement (1) we can learn that:  $Y < Z$  also, this is not enough.

From statement (2) we know that Y is very tall, one of the highest in the world, but X can still be higher. Therefore, more sufficient data is required to answer the question.

11. How many steaks did the restaurant sell between 20:00 P.M and 21:00 P.M on Wednesday?

(1) On Tuesday the restaurant sold 25 steaks between the hours of 20:00 P.M and 21:00 P.M.

(2) The average amount of steaks that are sold on Wednesdays is 25 steaks per hour.

(a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d)Either statement BY ITSELF is sufficient to answer the question.

(e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Both statements do not provide us with any vital information about the specific number of steaks that were sold on that specific hour. The average is not accurate enough for the question and the sales of Tuesdays could be different than those in Wednesdays. Therefore, more sufficient data is required.

12. How many bananas did Jerry the monkey eat today?

(1) Today, Jerry ate 30% more than his regular average.

(2) Yesterday, Jerry ate 32 bananas, which is 15% less than his regular average.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From both statements together we know the average amount of bananas eaten by Jerry and that today Jerry ate 30% more than his regular average. Therefore, both statements together supply sufficient information to answer the question.

13. A student is studying for a test from 11:00 A.M to 20:00 P.M on weekdays and one third of that time on Saturdays, on Sundays he takes a break from school and goes fishing. For what fractional part of the entire week is the student studying?

(a)  $2/5$ .

(b)  $3/7$ .

(c)  $2/7$ .

(d)  $3/8$ .

(e)  $5/2$ .

The best answer is C.

On weekdays, the student studies for 9 hours, on Saturdays 3 hours.

In one week the student studies for  $(5 \times 9 + 3 = 48)$ .

The total number of hours in one week is  $(24 \times 7 = 168)$ .

$48 \text{ hours} / 168 \text{ total hours} = 2/7$ .

14. An average teenager sleeps from 23:00 P.M till 7:30 in the morning of a school's night and on the weekend, which is Friday and Saturdays he sleeps 50% more each night. For what fraction part of the entire week is the teenager asleep?

(a)  $48.75/168$ .

(b)  $52.5/120$ .

(c)  $17/42$ .

(d)  $55.5/168$ .

(e)  $15/38$ .

The best answer is C.

In one week there are  $(24 \times 7 = 168)$  hours.

The average teenager sleeps 8.5 hours on weekdays and  $(1.5 \times 8.5 = 12.75)$  hours on the weekend.

Altogether, the total sleeping time per one week is  $(8.5 \times 5 + 12.75 \times 2 = 68)$ .

The fractional part of the sleep is  $(68/168 = 17/42)$ .

15. The number 12 bus is working from 6:00 in the morning to 10:00 P.M on weekdays only. On Saturdays and Sundays the bus goes to the garage 3 times a day for upgrading, each time for 3 hours. For what fraction part of the entire week is the bus on the road?

(a)  $5/12$ .

(b)  $4/7$ .

(c)  $7/9$ .

(d)  $6/11$ .

(e)  $7/12$ .

The best answer is E.

In one week there are  $(24 \times 7 = 168)$  hours.

The bus is on the road everyday, on weekdays he is 16 hours on the road and on Saturdays and Sundays he drives for 9 hours each day. The total amount of hours is  $(16 \times 5 + 18 = 98)$ . The fraction part of the week is  $(98/168 = 7/12)$ .

16. Lilac has three times more Barbie dolls than Orly. If Lilac gives 6 dolls to Nirit, she would have 21 dolls left. How many dolls does Orly have?

(a) 5.

(b) 7.

(c) 9.

(d) 11.

(e) 13.

The best answer is C.

The easiest way to solve such problems is by back-solving it.

Take answer C: If Orly has 9 dolls then Lilac has 27. If Lilac would give away 6 dolls she would really have 21 dolls left.

17. "Tires R' us" have 4 times more tires for sale than any regular tire shop. If "Tires R' Us" Sells 122 tires, they will have only three times more tires than the rest. How many more tires do "Tires R' us" have than the regular tire shop?

(a) 488.

(b) 388.

(c) 366.

(d) 299.

(e) 188.

The best answer is C.

Let's write the equations that come from the data: define  $x$  as the number of tires of "Tires R' us" and  $y$  as number of tires of the regular shop.

$$X = 4Y \text{ and } X - 122 = 3Y \rightarrow X = 488, Y = 122. X - Y = 366.$$

18. If  $512 = (A + 48)^3$ , then  $(A + 53)$  is equal to

13.

-10.

15.

-12.

5.

The best answer is A.

$$\text{If } 512 = (A + 48)^3 \rightarrow A + 48 = 8 \rightarrow A = -40.$$

Therefore,  $A + 53 = 13$ .

20. If  $529 = (Y - 7)^2$ , then  $Y/3$  is equal to

6.

8.

9.

10.

12.

The best answer is D.

$$529 = (Y - 7)^2, \text{ take the root out of both sides to get } 23 = Y - 7 \rightarrow Y = 30.$$

Therefore  $Y/3$  is equal to 10.

21. The East-17 pre-school is upgrading all of his classrooms by buying 46 computers, 6 printers and 5 fax machines. If a computer costs 4 times more than a printer and 2 times more than the fax machine, what percent of the cost of the entire purchase was the cost of one computer, 2 printers and 1 fax machine?

1%.

2%.

3%.

4%.

5%.

The best answer is D.

Let's define the price of a printer as  $X$ , the computer costs  $4X$  and the fax costs  $2X$ .

The total price of all the merchandise is  $(46 \times 4)X + 6X + 10X = 200X$ .

The specific group that was asked upon is worth  $4X + 2X + 2X = 8X$ .

The percentage of the price is  $(8/200) 4\%$ .

22. A newly wed couple is designing their new house by purchasing 10 chairs, 3 desks, 3 televisions and 4 closets. If the price ratio between the new merchandise is 1 : 3 : 4 : 4, what fraction of the cost of the entire purchase was the cost of a desk and a closet?

- 6/31.
- 7/47.
- 5/28.
- 9/43.
- 11/45.

The best answer is B.

Let  $X$  be the price of a single chair, normalize all the prices to the price of a chair.

The total price of the entire purchase is:  $10X + 9X + 12X + 16X = 47X$ .

The specific purchase costs:  $3X + 4X = 7X$ .

The percent required is  $7/47$ .

23. A grocery store ordered a delivery of fresh milk products that contained 45 milk bottles, 24 cheese packs and 23 cartons of chocolate milk. If the chocolate milk carton costs like a bottle of milk, which is three times the price of a cheese pack, what fraction of the cost of the entire purchase was the cost of 20 bottles of milk, 1 pack of cheese and 5 chocolate milk cartons?

- 1/6.
- 2/5.
- 1/4.
- 1/3.
- 3/7.

The best answer is D.

Let  $X$  be the price of a pack of cheese.

The price of the entire purchase is  $(45 \times 3)X + 24X + (23 \times 3)X = 228X$ .

The specific required purchase is  $60X + X + 15X = 76X$ .

The fraction of the specific purchase and the entire purchase is  $76/228 = 1/3$ .

26. If  $A$  and  $B$  are two prime numbers bigger than 2, which of the following can't be true?

- (1)  $A + B$  is an even number.
- (2)  $A \times B$  is also a prime number.
- (3)  $A^B$  is also a prime number.

- 1 only.
- 2 only.

- 3 only.
- 2 and 3 only.
- 1, 2 and 3.

The best answer is D.

Try to find opposing examples to the statements.

1. Pick  $A=7, B=13 \rightarrow A+B = 20$ , this is an even number.
2. Try  $A=3, B=7 \rightarrow AB=21$ , and 21 is not a prime number.
3. Try  $A=3, B=5 \rightarrow A^B = 3^5 = 3 \times 3 \times 3 \times 3 \times 3 =$  a number which is dividable by 3 and 9 and therefore is not a prime number. Statements 2 and 3 can't be true, the answer is D.

27. If X and Y are consecutive numbers ( $Y>X$ ), which of the following statements could be false?

1. The multiplication XY is an even number.
2.  $(Y/X) > 1$ .
3.  $(X + Y)$  is always an odd number.

- 1 only.
- 2 only.
- 1 and 2 only.
- 1 and 3 only.
- 1, 2 and 3.

The best answer is B.

Let's go over each statesman's at a time.

- 1, the multiplication of two consecutive numbers is always an even number.
  - 2, Try  $x=2, y=3 \rightarrow$  In this case  $3/2$  is bigger than 1 but if you choose  $x=-3, y=-2, y/x$  is  $2/3$  and that's smaller than 1. Therefore this statement is not always true.
  - 3, the sum of two consecutive numbers is always odd, try some numbers.
- Therefore, only statement 2 is false.

28. X and Y are integers, X is even and negative, Y is odd and positive. Which of the following could be false?

1.  $(X + Y)$  is an odd number.
2.  $Y^{(X + Y)}$  is an integer.
3.  $X^Y$  is a positive number.

- 2 only.
- 3 only.
- 1 and 3 only.
- 2 and 3 only.
- 1, 2 and 3.

The best answer is D.

Find opposing examples for each of the statements.

- 1: An odd number + an even number are always an odd number.

2: Try the numbers:  $X=-4, Y=3 \rightarrow 3^{(-1)} = 1/3$  which is not an integer.  
3: Try the numbers:  $X=-2, Y=3 \rightarrow X^Y = (-2)^3 = -8$ , which is not positive.  
Statements 2 and 3 are not necessarily true.

If  $W$  is between  $(-1)$  and  $(0)$ , which of the following is least?

- W.
- $W^2$ .
- $1/W$ .
- $(1/W)^2$ .
- 0.

The best answer is C.

Try a number between  $-1$  and  $0$ , for example  $-1/2$ .

- $-1/2$ .
- $1/4$ .
- $-2$ .
- 4.
- 0.

The smallest number is  $-2$ .

2. If  $R$  is between  $(-2)$  and  $(2)$ , which of the following can be the greatest?

- $(1/R)$ .
- $R^2$ .
- $R^3$ .
- $R^4$ .
- 32.

The best answer is A.

If we can choose any number between  $(-2)$  and  $(2)$ , choose a really small number, for example

$(1/100) \rightarrow$  plug it in answer (a),  $(1/1/100) = 100 \rightarrow$  none of the other answers can be larger.

3. If all values of  $X$  such as  $(0 < X < 1)$ , which can be the least?

- 0.
- $X$ .
- $X^2$ .
- $(X - 1)^2$ .
- $X^3$ .

The best answer is E.

Since  $X$  is a fraction between  $0$  and  $1$ , the smallest answer will be that of the highest power, since all the answers are positive. Therefore (e) is the smallest possible.

Pay attention to answer (d), it's the same as (c); it's a fraction between  $0$  and  $1$  squared.

4. By what percent did the price of a pound of plum increase?

(1) Each pound of plum costs 28 cents more.

(2) The original price per pound was 52 cents.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

By using both statements together we know what was the original price and by how much it increased.

Each statement alone is not sufficient, but the combination of the two is sufficient.

Remember, you don't have to solve the problem; you only need to make sure you can.

5. What is the new price for a pound of persimmon?

(1) The old price is 45 cents per pound.

(2) The new price is more than half of the old price.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

We need to find the exact price of the persimmon.

If the old price is 45 cents and the new price is more than half of the old price then the exact price of the new persimmon is not an exact price but a price bigger than 22.5 cents.

There isn't enough sufficient data to solve the question.

6. How many days would it take two carpenters, working together, to build 5 desks?

(1) Each carpenter can build 4 desks in two days.

(2) Two carpenters, working together, work twice as fast as one carpenter working alone.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is A.

In order to solve the question, we need to know the output of one carpenter.

From statement (1) we can learn that one carpenter has a certain output, and using the output formula we can calculate the desired time. Statement (2) is not useful; it tells us something that we can already assume by ourselves.

Therefore the answer is A.

7. How many diamond rings can a goldsmith refine in two weeks?

(1) There are 4 diamonds in each ring.

(2) One goldsmith can refine 2 diamonds in 4 hours.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Both statements combined are sufficient to answer the question.

Statement (1) tells us how many diamonds are there in one ring.

Statement (2) tells us how much time is needed to complete one ring; therefore both data's are sufficient to answer the question.

8. How long will it take 5 chambermaids to arrange the beds of the entire hotel?

(1) There are 4 floors in the hotel.

(2) Each floor contains 6 rooms.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

In order to answer the question, we need to know how many beds are there in the hotel.

Both statements, taken together, don't supply that kind of information.

Therefore more sufficient data is required.

9. How many patients can a group of dermatologists diagnose in one day?

(1) Two dermatologists can diagnose 3 patients in 1.5 hours.

(2) Dermatologists work for 8 hours a day.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Both statements are not sufficient, you don't know what the size of the group of dermatologists is; it can be 3 doctors or even 45. Therefore more sufficient data is required.

11. How long will it take Jimmy to organize his stamp collection?

(1) Jimmy can organize 45 stamps in 2 hours.

(2) In the collection there are 30 regular stamps and 90 special ones.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Both statement combined are sufficient.

Statement (1) tells us that what is the "output" of organizing stamps and statement (2) tells us how many apples are there in the collection. Pay attention, it doesn't matter if

the stamps are regular or special ones because statement (1) states that (any) 45 stamps can be arranged in 2 hours.

15. A train traveled for three hours. In the first hour the train traveled 86 miles, which was 25% farther than it traveled in the first hour. In the third hour the train traveled at a speed of 120 miles per hour for 20 minutes. What is the total distance that the train traveled?

- 190.6.
- 194.8.
- 198.2.
- 204.5.
- 212.8.

The best answer is B.

In the first hour it traveled 86 miles.

In the second hour it traveled  $x$  miles,  $x + 0.25x = 86 \rightarrow x = 68.8$  miles.

In the third hour it traveled  $(120 \times \frac{1}{3} = 40)$  miles.

The total distance is  $(86 + 68.6 + 40 = 194.8)$  miles.

16. A cruise ship traveled for 3 hours. In the first hour, the ship sailed at a speed of 25 Km/h, which was 25% faster than the speed in the third hour. In the middle hour the ship sailed at the average speed of the first and third hours. What was the total distance of the ship during the 3 hours of sailing?

- 65.
- 66.5.
- 67.5.
- 70.
- 72.5.

The best answer is C.

The distance in the first hour is 25 Km.

The speed in the third hour is  $(25/1.25 = 20 \text{ Km/h})$  and therefore the distance is 20 Km.

The average speed is 22.2 Km/h and that is also the distance.

The total distance is  $25 + 20 + 22.5 = 67.5$  Km.

17. Two cars are driving towards one another. The first car is traveling at a speed of 120 Km/h, which is 28% faster than the second car. If the distance between the cars is 855 Km, how long will it take the cars to meet (in hours)?

- 2.5.
- 3.
- 3.5.
- 4.
- 4.5.

The best answer is D.

The speed of the second car is  $X$ ,  $(X + 0.28X = 120) \rightarrow X = 93.75$  Km/h.

In order to find the time it will take the cars to meet, you should divide the total distance by the sum of the car's speeds:  $(855 / (120+93.75) = 4)$ . Therefore the answer is D, four hours.

18. Three cars are starting to drive from three corners of a huge axi-cimetical triangle towards the middle. Car A can travel at a speed of 110 miles per hour, car B can travel 10% less and car C can travel the average speed of the first two cars. If all cars leave at the same time and it took car A 30 minutes to get to the middle, how long approximately after car C reached the middle, did car B reached it?

About 15 minutes.

About 10 minutes.

About 5 minutes.

About 1.5 minutes.

They reached the middle at the same time.

Start with the speeds of the cars:

Car A can travel at 110 mp/h.

Car B can travel at a speed of  $(110 \times 0.9) 99$  mp/h.

Car C can travel at a speed of  $(110 + 99)/2 = 104.5$  mp/h.

If it took car A 30 minutes, the length towards the middle of the triangle is 55 miles.

Calculate how long it takes car B and car C travel 55 miles:

Car B  $\rightarrow$  It will take her  $(55/99)$  hours which is 33 minutes and a third.

Car C  $\rightarrow$  It will take her  $(55/104.5)$  hours which is approximately 31.6 minutes.

Therefore the differences in the time will be approximately 1.5 minutes.

19. Danny and Steve are running towards each other, each one from his own house. Danny can reach Steve's house in 25 minutes of running, which is half the time it takes Steve to reach Danny's house. If the two started to run at the same time, how much time longer will it take Steve to reach the middle than Danny?

12.5 minutes.

25 minutes.

35 minutes.

50 minutes.

75 minutes.

The best answer is A.

If it takes Danny 25 minutes to travel the full way, it would take him 12.5 minutes to reach the middle.

If it takes Steve 50 minutes to travel the full way, it would take him 25 minutes to reach the middle.

The difference in the time it takes them to reach the middle is 12.5 minutes.

20. A green lizard can travel from the green cave to the blue cave in 108 minutes; the blue lizard can travel from the blue cave to the green cave in 25% less time. If the green lizard started to travel 7.5 minutes before the blue lizard, how many minutes after the blue lizard, will the green lizard pass the middle line?

- 2.
- 3.5.
- 4.
- 5.5.
- 6.

The best answer is E.

It takes the green lizard ( $108/2 = 54$ ) minutes to reach the middle.

It takes the blue lizard ( $(108 \times 0.75 = 81)/2 = 40.5$ ) minutes to reach the middle.

The green lizard started to travel 7.5 minutes ahead of the blue lizard and therefore the differences in the time they reach the middle is ( $54 - 7.5 - 40.5 = 6$ ) minutes.

21. When an integer  $Q$  is divided by 6, the remainder is 4.

Which of the following is not a multiple of 6?

- $Q + 2$ .
- $Q - 4$ .
- $2Q + 6$ .
- $3Q$ .
- $4Q + 2$ .

The best answer is C.

Pick a number that fits into the question, for example 10.

The only answer that is not a multiple of 6 is C,  $2Q + 6 = 26$ . And 26 are not divisible by 6.

22. When the integer  $Y$  is divided by 11, the remainder is 3.

Which of the following can't be a multiple of  $(Y+1)$ ?

- $2Y + 2$ .
- $1.5Y + 9$ .
- $2.5Y - 5$ .
- $3Y + 3$ .
- $3Y - 5$ .

The best answer is E.

Plug in a number that will give a remainder of 3 when divided by 11, for example 14.

We are looking for a number that is not a factor of  $(Y+1 = 15)$ .

The only answer that is not a factor of 15 is E.  $3Y - 5 = 37$ .

23. When the integer  $X$  is divided by 5, the remainder is 2.

Which of the following can be a multiple of  $(X+3)$ ?

- 8X + 7.
- 9X - 3.
- 11X - 4.
- 13X.
- 13X + 1.

The best answer is B.

Plug in a number that will give a remainder of 2 when divided by 5, for example 7.

We are looking for a number that is a factor of 10.

The only possible answer is B  $\rightarrow 9 \times 7 - 3 = 60$ , and that is a factor of 10.

25. What is the value of  $X + Y$ ?

(1)  $X = 3Z$ .

(2)  $Y = 8Z$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

According to the statements, the value of  $X + Y$  is  $3Z + 8Z = 11Z$ , but we don't know what's the value of  $Z$ . In other words, more sufficient data is required to answer the question.

26. What is the value of  $(Q + W)$ ?

$W = 3R$ .

(2)  $Q = -3R$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Combine both statements to get,  $W + Q = 3R - 3R = 0$ .

In other words the statements tell us that  $W = (-Q)$  or the opposite.

27. What is the value of (XY)?

(1)  $X = 2/(9Q)$ .

(2)  $Y = 4.5Q$ .

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Combine both statements to get,  $XY = 4.5Q \times 2/(9Q) = 1$ .

Therefore both statements taken together are sufficient.

28. Harris invested \$45,000 in two different ventures, a car-cleaning machine and a video mat. The yearly return on the video mat was 12% and the yearly return on the car-cleaning machine was 8%. If the total return was \$4,000, how much did Harris invest in the video mat?

\$8,000.

\$10,000.

\$14,000.

\$22,000.

\$35,000.

The best answer is B.

The easiest way is to back solve the question.

Take answer B, if that is the amount Harris invested in the video mat; the annual return was \$1,200.

Therefore there are \$35,000 left to invest in the car-cleaning machine, 8% of 35,000 is \$2,800.

Sum them up; the total return is like the question asked- \$4,000.

29. Jennifer bought two apartments in order to rent them to other people with \$300,000. The monthly return on the first apartment is 1.5% of its value and on the second apartment the return is 2% of its value. If the total returns of the entire year were \$61,200, how much did Jennifer spent on the second apartment?

\$100,000

\$120,000

\$150,000

\$180,000

\$210,000

The best answer is B.

The easiest way is to back solve the question.

Take answer B, if that is the amount Jennifer invested in the second apartment; the annual return from that apartment was ( $120,000 \times 0.24 = 28,800$ ). Therefore there are \$180,000 left to invest in the first apartment, 18% of \$180,000 is \$32,400.

Sum them up; the total return is like the question asked- \$61,200.

3. Two cars are traveling on the same road towards each other. If car A is traveling at a speed of 120 Km/h and car B is traveling 15% slower, how much time will it take the cars to meet if the initial distance between the two is 668.4 Km and car A started to drive one hour and a half before car B started?

(a) one hours and 30 minutes.

(b) two hours.

(c) two hours and 12 minutes.

(d) three hours and 15 minutes.

(e) three hours and 18 minutes.

The best answer is C.

Car B is traveling at a speed of  $0.85 \times 120 = 102$  Km/h.

Car A travels alone a distance of  $120 \times 1.5 = 180$  Km. The remaining distance should be divided among the sum of the cars speeds:  $(668.4 - 180 = 488.4 \text{ Km}) / (102 + 120) = 2.2 =$  Two hours and 12 minutes.

5. Water has been poured into an empty rectangular tank at the rate of 8 cubic feet per minute for 2.5 minutes. The length of the tank is 3 feet and the width is one half of the length. Approximately how deep is the water in the tank?

- (a) 3.23 feet
- (b) 3.86 feet
- (c) 4 feet
- (d) 4.25 feet
- (e) 4.44 feet

The best answer is E.

First calculate the volume of water that has been poured into the tank. If it has been poured at a rate of 8 cubic feet per minute for 2.5 minutes,  $8 \times 2.5 = 20$  cubic feet. The tank is rectangular, so its volume is length  $\times$  width  $\times$  height (or depth), with the answer in cubic units. We are given the length, and can calculate the width, since we are told that the width is  $1/2$  the length, or  $1/2$  of 3 feet, or 1.5 feet. The volume we have already calculated to be 20 cubic feet. Therefore,  $20 = \text{length} \times \text{width} \times \text{height}$ , or  $20 = 3 \text{ feet} \times 1.5 \text{ feet} \times \text{the height}$ . Solving for the height, we get  $40/9$ , or approximately 4.44 feet.

15. Roy is now 4 years older than Erik and half of that amount older than Iris. If in 2 years, Roy will be twice as old as Erik, then in 2 years what would be Erik's age multiplied by Iris's age?

- (a) 8
- (b) 28
- (c) 48
- (d) 50
- (e) 52

The best answer is C.

Translate piece by piece into numbers. R (Roy) = Erik (E) + 4.

The second equation: R = I (Iris) + 2.

The third equation: R + 7 = 2(E + 7). We have three equations with three variables.

→ Roy is 6, Iris is 4 and Erik is 2. In four years Erik would be 6 and Iris 8, the answer is 48.

20. An investment yields an interest payment of \$228 each month. If the simple annual interest rate is 9%, what is the amount of the investment?

- (a) \$28,300
- (b) \$30,400
- (c) \$31,300
- (d) \$32,500
- (e) \$35,100

The best answer is B.

Principal  $\times$  percent interest = interest earned

Principle  $\times$  (0.09) $\times$  1/12 = \$228.

Solve for the principal  $(228 \times 12)/.09 = \$30,400$ .

x, y, z, and w are integers. The expression x-y-z is even and the Expression y-z-w is odd. If x is even what must be true?

y-z must be odd.

w must be even.

w must be odd.

z must be even.

Z must be odd

The best answer is C.

The first expression is even and the second is odd, the differences between the two expressions is x instead of w. (remember, there is no difference in odd/even numbers if the number is positive or negative so y-z is like z-y). Therefore if x is even w must be odd.

5. X is a prime number bigger than 10. Also,  $Y = X + X^3 + X^5 + X^7$ .  
What is definitely true about Y?

Y is a prime number.

Y is odd.

Y is even.

Y can be divided equally by 3.

Y can be divided equally by 7.

The best answer is C.

Because X is a prime number bigger than 10, he must be odd. Ignoring the powers of X in the expression of Y, you'll see that Y is a sum of 4 odd numbers therefore it must be even.

12. In Tukitu village, one fourth of the people are raising flowers, one ninth are growing wheat and one eleventh are going bankrupt. What could be the number of people in the village?

792.

540.

198.

132.

346.

The best answer is A.

The answer must be a number that is divisible equally by 4, 9 and 11.  
The only possible answer is A.

17. Q is a prime number bigger than 10. What is the smallest positive number (except 1) that 3Q can be divided by equally?

- 3Q.
- Q.
- 3.
- Q+3.
- 2Q.

The best answer is C.

3Q is a prime number so it can be divide equally by 3Q, by 1 and by the components 3 and Q. The smallest number therefore is 3.

27.  $35^2 - 34^2 = ?$

- 35 – 34.
- 35 + 34.
- $35^2$ .
- 2 x 35 x 34.
- 34.

The best answer is B.

$35^2 - 34^2 = (35 - 34)(35 + 34) = 1(35 + 34)$ . B is the answer.

18. Kelly used to get a 30% discount on movie tickets. When the price of the movie ticket increased by 50%, the amount of discount in dollars remained the same. What is Kelly's discount with the new Ticket price in percent terms?

- (a) 10%
- (b) 20%
- (c) 25%
- (d) 35%
- (e) 38%

The best answer is B.

The price of the ticket is unknown. Take 100 as an exapmle.

30% discount of 100 is \$30, that amount stayed the same after the price of a ticket grew by 50%.

The new price of a ticket is \$150, so 30/150 is 20%.

1. Tom divided his cards between Tim and Din so each one received an odd amount of cards. The number of cards that Tim received multiplied by the number of cards that Din received is a number larger than 49 and smaller than 121. How many cards did Tom have in the first place?

- 16.
- 22.
- 18.
- 14.
- 32.

The best answer is C.

Answers A and E are disqualified immediately because those are even numbers that cannot be divided into two odd numbers. 22 is  $11 + 11$  but  $11 \times 11$  is bigger than 121, the same idea with 14, therefore the answer is 18.  $18 = 9 + 9$ .  $9 \times 9 = 81$ .

10. In the beginning of the season, the owner of a football team bought T players for the price of 4R each. At the end of the season the owner sold the players in a total profit of X. How much did the owner get for all the players?

- X – 4TR.
- 4X + 4TR.
- 4TR + X.
- 4(TR – X).
- 4TR – X.

The best answer is C.

The owner bought T player that cost him altogether 4TR.  
He had a profit of X so he sold them for 4TR + X.

18. A bird is flying from an oak tree to a pine tree in a speed of 6 Km/h.  
On her way back, she flew at a speed of 4 Km/h, thus, the trip lasted 4 hours more.  
What is the distance between the trees? (In Km)

- 12.
- 24.
- 36.
- 48.
- 52.

The best answer is D.

The distance to the pine tree is  $6 \times X$ , where X represents the time of the trip. The distance back to the oak tree is  $4(X+4)$ , assuming the trip back is equal in length. Therefore  $6X = 4(X+4) \rightarrow X = 8$ . The length of the trip is  $8 \times 6 = 48$  Km.

13. In a chocolate store, there are vanilla and chocolate flavor bon-bons only. 10% of the bon-bons are chocolate flavored, 90% of the rest are squashed. What percentage of the bon-bons is vanilla flavored that are not squashed?

- (a) 1%
- (b) 5%
- (c) 9%
- (d) 10%
- (e) 2%

The best answer is C.

Pick a number of bon-bons, like 100 for example.

10 are chocolate, 90% of the rest ( $0.9 \times 90 = 81$ ) are squashed.

That means that only 9 are vanilla and are not squashed.

23. A credit card number has 6 digits (between 1 to 9). The first two digits are 12 in that order, the third digit is bigger than 6, the fourth one can be equally divided by 3 and the fifth digit is 3 times bigger than the sixth one. How many credit cards can be made?

- (a) 27.
- (b) 36.
- (c) 72.
- (d) 112.
- (e) 422.

The best answer is B.

First digit is 1, the second is 2, the third can be (7,8,9), the fourth can be (0,3,6,9), the fifth and the sixth are dependent with one another. The fifth one is 3 times bigger than the sixth one, therefore there are only 3 options there: (1,3), (2,6), (3,9).

All together there are:  $1 \times 1 \times 3 \times 4 \times 3 = 36$  options.

25. Out of a box that contains 4 black mice and 6 white ones, three are picked up. What is the probability that all three will be black mice?

- (a)  $8/125$ .
- (b)  $1/30$ .
- (c)  $2/5$ .
- (d)  $1/720$ .
- (e)  $3/10$ .

The best answer is B.

The probability for the first one to be black is:  $4/(4+6) = 2/5$ .

The probability for the second one to be black is:  $3/(3+6) = 1/3$ .

The probability for the third one to be black is:  $2/(2+6) = 1/4$ .

The probability for all three events is  $(2/5) \times (1/3) \times (1/4) = 1/30$ .

28. A car is driving at 60 Km/h for 20 minutes, and then drives at 90Km/h for another 40 minutes. What is the average speed of the car?

- (a) 80.
- (b) 75.
- (c) 70.
- (d) 65.
- (e) 54.

The best answer is A.

The average speed is equal to:  $(\text{Total distance})/(\text{Total time}) = (60 \times 1/3 + 90 \times 2/3)/1 = 80 \text{ Km/h}$ .

36. Two grandfathers can nit a sweater in 6 days. Two grandfathers and one grandmother can nit a sweater in 3 days. How many days will it take the grandmother to nit a sweater all by her self?

- (a) 4.5.
- (b) 5.
- (c) 5.5.
- (d) 6.
- (e) 6.5.

The best answer is D.

Two grandfathers and a grandmother can nit a sweater in 3 days, therefore they can nit 2 sweaters in 6 days. Because two grandfathers can nit 1 in 6 days then the other sweater is done by the grandmother, she can nit 1 sweater in 6 days.

12. In a psychology school the grade of the students is determined by the following method: At the end of the first year the grade equals to twice the age of the student. From then on, the grade is determined by twice the age of the student plus half of his grade from the previous year. If Joey's grade at the end of the first year is 40, what will be his grade at the end of the third year?

- (a) 75.
- (b) 62.
- (c) 80.
- (d) 44.
- (e) 56.

The best answer is A.

From the grade 40 at the end of the first year we learn that his age is 20.

At the end of the second year, he will be 21 and his grade will be

$$(21 \times 2 + \frac{1}{2} \times 40 = 62).$$

At the end of the third year, he will be 22 and his grade will be  $(22 \times 2 + \frac{1}{2} \times 62 = 75)$ .

18. In a triangle, one side is 6 Cm and another side is 9 Cm. which of the following can be the perimeter of the triangle?

- (a) 18.
- (b) 25.
- (c) 30.
- (d) 32.
- (e) 34.

The best answer is B.

The third side of the triangle is larger than 3 (The difference between the other two) and smaller than 15 ( The sum of the other two).

The perimeter is between  $(6+9+3 = 18)$  and  $(6+9+15 = 30)$ . The only answer that is in this range is B.

24. A long rope was divided to three different parts. What is the length of the smallest piece?

- (1) The sum of the two smaller pieces is 14 inch.
- (2) The sum of the two larger pieces is 22 inch.

The best answer is E.

Translate the statements into variables: Let X, Y and Z be the three pieces of the rope,  $X < Y < Z$ .

Statement (1) can be written as:  $X + Y = 14$ .

Statement (2) can be written as:  $Y + Z = 22$ .

In order to find the length of the smallest piece, we need another equation or data.

More data is required.

26. Fuel tanker A can fill the underground reservoir in 12 minutes. How long will it take fuel tanker A and fuel tanker B to fill up the same reservoir together?

- (1) The reservoir contains 3000 liters of fuel.
- (2) Fuel tanker A alone will require the same number of hours to fill the same reservoir.

The best answer is B.

Statement (1) is insufficient since the size of the reservoir is irrelevant.

Statement (2) is sufficient since it tells us that the second tanker has the same output as the first one and so it will take them both half of the time it took the first tanker alone.

28. What is the ratio between A and B?

(1) A is the sum of X, Y and Z.

(2) B is the average (arithmetic mean) of X, Y and Z.

The best answer is C.

Statement (1) tells us that  $A = X + Y + Z$ .

Statement (2) tells us that  $B = (X + Y + Z)/3$ .

Using both statements together:  $A/B$  is 3.

Both statements together are sufficient.

30. If X and Y are both integers different from zero, what is the value of  $(X + 2Y)$ ?

(1)  $X^4 = Y^4$ .

(2)  $X = 5$ .

The best answer is E.

Don't rush the answer, pay attention to the question carefully.

Statement (1) tells us that X and Y are equal? No, they could have different signs.

Statement (2) gives us X, which is not sufficient.

Both statements together are also insufficient since Y can be  $-5$  or  $5$ .

More sufficient data is required.

3. Is the square root of A an integer?

(1) The last digit of A is 8.

(2) A is divisible by 6.

The best answer is A.

If you square each digit  $\{0, 1, 2, \dots, 8, 9\}$ , you will see that the only possible last digits for a square are 0, 1, 4, 5, 6 and 9. Thus, if the last digit of A is 8, A cannot be a square. So the square root of A is not an integer. So statement (1) by itself is sufficient. Since 36 is divisible by 6 and its square is an integer, this statement is insufficient by itself.

7. Is the average of  $X$  consecutive numbers odd?

(1) The first number in the series is odd.

(2) The sum of the numbers is odd.

The best answer is B.

Statement (1) is insufficient by itself, take  $X$  as 2: if the first number is odd, the sum of the two numbers is odd. Take  $X$  as 3: if the first number is odd, the sum of the three numbers is even.

Statement (2) tells us that the sum of the numbers is odd and therefore the median must be odd.

If the median is odd the average of these numbers is also odd because that means that there is an even amount of even numbers and an odd amount of odd numbers.

This statement is sufficient by itself.

14. If  $X$  and  $Y$  are integers, what is the value of  $XY$ ?

(1)  $X^3 - 3X^2 - 2X - 8 = 0$ .

(2)  $4 + 3Y = 2Y + 8$ .

The best answer is C.

Statement (1) can be written as  $(X - 4)(X^2 + X + 2) = 0$ .

The roots of this equation are one integer and two complex numbers, which you should pay no attention to since you were told that  $X$  is an integer.

Statement (2) is a simple equation,  $Y = 4$ .

The value of the expression  $XY$  is 16.

Both statements, taken together, are sufficient to answer the question.

21. Each of the 850 local villagers in Lucia owns either a Golden Retriever or a Bernard. How many people own both?

(1) The number of villagers who own a Golden Retriever only is 300.

(2) The number of villagers who own a Bernard only is 280.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question,

The best answer is C.

Each one of the villagers, according to the question, has to own at least one of the two dogs.

Statement (1) is insufficient because it says nothing about the Bernard owners.

Statement (2) is insufficient because it says nothing about the Golden Retriever owners.

Combine the statements, all the information we need is present,  $(800 - 300 - 280)$  is equal to the number of people who own both races of dogs.

4. How much is Y percent of X?

(1) 400% of Y is 90.

(2) X percent of Y is 25.

The best answer is B.

Statement (1) gives us data on Y only regardless to X and therefore it's insufficient.

Statement (2) tells us how much is X percent of Y. Make up numbers,  $X = 25$  and  $Y = 100$ .

X percent of Y is 25 but we also know how much is Y percent of X, 100 is 400% of 25 and therefore this statement is sufficient by itself.

11. What is the sum of 11 consecutive integers?

(1) The median of the 11 integers is 6.

(2) The average of the 11 integers is 6.

The best answer is D.

Statement (1) provides us with the numbers themselves- 5 on each side of 6.

From Statement (2) we know that average = sum / amount  $\rightarrow$  sum = 66.

Therefore either statement is sufficient to answer the question.

6. X, Y and Z are three positive integers. If  $Z = 2$ , what is their sum?

(1)  $X - Y = 5$ .

(2)  $3Y + 15 = 3X$ .

The best answer is E.

We need to find the value of  $X + Y$  since  $Z$  is already given to us.  
Statement (1) is insufficient since we need the sum of  $X$  and  $Y$ .  
Statement (2) can be written as:  $3X - 3Y = 15 \rightarrow X - Y = 5$ , you can see that both statements are the same and therefore more sufficient data is required.

10. Is  $Y$  even?

(1)  $2Y$  is even.

(2)  $Y^2$  is even.

The best answer is C.

Statement (1) by itself is insufficient because every number that is multiplied by 2 will result in an even number. Statement (2) is also insufficient by itself since numbers like  $\sqrt{6}$  fulfills this statement although it's not even. Combine the statements and  $Y$  must be an even number.

15. If  $A$  is a prime number, what is the value of  $A$ ?

(1)  $0 < A < 10$ .

(2)  $(A - 2)$  is divisible by 3.

24. A long rope was divided to three different parts. What is the length of the smallest piece?

(1) The sum of the two smaller pieces is 14 inch.

(2) The sum of the two larger pieces is 22 inch.

The best answer is E.

Translate the statements into variables: Let  $X$ ,  $Y$  and  $Z$  be the three pieces of the rope,  $X < Y < Z$ .

Statement (1) can be written as:  $X + Y = 14$ .

Statement (2) can be written as:  $Y + Z = 22$ .

In order to find the length of the smallest piece, we need another equation or data.  
More data is required.

1. Two adjacent angles of a parallelogram are in the ratio of 1:3. What is the smaller angle of the two?

- (a) 30.
- (b) 45.
- (c) 90.
- (d) 135.
- (e) 180.

The best answer is B.

The sum of two adjacent angles in a parallelogram is 180. 180 divided by  $4(1+3)$  is 45 and that is the size of the smallest among the angles.

2. Two adjacent angles of a parallelogram are in the ratio of 2:3. What is their average size?

- (a) 30.
- (b) 40.
- (c) 45.
- (d) 90.
- (e) 180.

The best answer is D.

The ratio doesn't give us anything, two adjacent angles of a parallelogram always sum up to 180 degrees. And  $180/2$  is always 90 degrees.

3. The angles of a triangle are in the ratio of 3: 2: 1. The largest angle in the triangle is:

- (a) 36.
- (b) 45.
- (c) 72.
- (d) 90.
- (e). 108.

The best answer is E.

The sum of all the angles is 180. Divide 180 by 6 ( $3+2+1$ ) and we'll get 36; this is the size of the smallest angle. The largest angle is three times bigger, thus  $36 \times 3 = 108$  degrees.

4. The perimeter of a circle is approximately 6.3 centimeters. The area of the same circle is A. which of the following is true?

- (a)  $1 < A < 2$ .
- (b)  $2 < A < 3$ .

- (c)  $3 < A < 4$ .
- (d)  $4 < A < 5$ .
- (e)  $A > 5$ .

The best answer is C.

The perimeter of a circle is  $2 \cdot \pi \cdot R$ ,  $2 \cdot \pi \cdot R \cong 6.3 \Rightarrow R \cong 1$  cm.

$A = \pi \cdot R^2$ , Therefore A is approximately pie (3.14).

8. John bought grocery products for 10 dollars using 55 coins. If John used quarters and dimes, what is the difference between the numbers of dimes to the number of quarters that he used?

- 5.
- 10.
- 15.
- 25.
- 30.

The best answer is A.

Define X as the number of dimes that John used. Just a reminder, dimes are 10 cents coins.

The number of quarters that he used is  $(55 - X)$ . We can write the following equation:

$10X + 25(55 - X) = 1000$ . Notice that 1000 is the money he spent in cents.

Therefore  $(-15X = -375) \rightarrow X = 25$ .

The number of dimes is 25 and the number of quarters is  $(55 - 25 = 30)$ .

The difference between the amounts is 5 coins.

9. Rick deposited \$850 to his bank account using \$5 and \$15 dollar bills only. If Rick came to the bank with 70 bills and left with 10 bills only, how many \$15 dollar bills did he deposit?

- 5.
- 25.
- 50.
- 55.
- 65.

The best answer is D.

Rick came to the bank with 70 bills and left with 10 and therefore he deposited 60 bills.

Define X as the number of \$5 dollar bills that he deposited and so  $(60 - X)$  is the number of \$15 bills that he deposited.

We can write the following equation:  $5X + 15(60 - X) = 850 \rightarrow -10X = -50 \rightarrow X = 5$ .

The number of \$15 dollar bills is  $(60 - 5) 55$ .

10. The average (arithmetic mean) of four numbers is equal to three times the largest number. If the largest number is equal to 3, what is the sum of the other three numbers?

- 28.
- 33.
- 35.
- 38.
- 42.

The best answer is B.

Let's say the four numbers are: X, Y, Z and W.

The average of all four numbers is equal to 3 times the value of the largest number:

$(X+Y+Z+W)/4 = 3W$ . W is equal to 3 and therefore  $(X+Y+Z+3) = 3 \times 9$   
 $\rightarrow X+Y+Z = 36-3 = 33$ .

11. What is the reciprocal of  $(AB)/(A + B)^2$  ?

- $(AB)/(A^2 + 2AB + B^2)$ .
- $A/B + B/A + AB$ .
- $B/A + A/B + 2$ .
- $(A^2 + B^2)/AB$ .
- $A/B + 2AB$ .

The best answer is C.

The reciprocal of  $X$  is  $1/X$  and therefore the reciprocal of  $(AB)/(A + B)^2$  is  $(A + B)^2/AB$ .

Simplify the expression:  $(A + B)^2/AB = (A^2 + 2AB + B^2)/AB = \underline{A/B + B/A + 2}$ .

12. Naomi drives to the beauty parlor in 60 minutes. On the way back, her average speed is half the average speed as it was to the way to the parlor. How much time will it take Naomi to travel two round trips to the beauty parlor?

3 hours.

4 hours.

4 hours and 20 minutes.

5 hours and 50 minutes.

6 hours.

The best answer is E.

If the average speed from the beauty parlor is half of the average speed to the parlor then the time back from the parlor is twice the time it takes her to get to the parlor, thus 120 minutes.

The total round trip will take Naomi  $(60 + 120 = 180)$  minutes, which is 3 hours.

Two round trips will take her 6 hours.

13. It takes Tanya 50 minutes to drive to the country club. If the average speed of the entire round trip to the club is 87.5% of the average speed on the way to the club, how many minutes approximately will it take Tanya to drive home from the country club?

42 minutes.

48 minutes.

52 minutes.

54 minutes.

66 minutes.

The best answer is C.

Define  $X$  as the average speed to the country club and  $Y$  as the average speed on the way back.

The average speed of the entire round trip to the club is 87.5% of the average speed on the way to the club:  $(X + Y)/2 = 0.875X \rightarrow X + Y = 1.75X \rightarrow Y = 0.75X$ .

The average speed on the way back is 75% of the speed to the club.

If the time it takes her to get to the country is  $T$ , then  $T/0.75$  is the time it will take to get back home.

$50/0.75 =$  approximately 66 minutes.

14. It costs \$4 for the first  $\frac{1}{4}$  hour to use the laundry machine at the Laundromat. After the first  $\frac{1}{4}$  hour it costs \$12 per hour. If a certain customer uses the laundry machine for 3 hours and 25 minutes, how much will it cost him?

\$25.

\$32.

\$36.

\$40.

\$42.

The best answer is E.

The customer uses the machine for 3 hours and 25 minutes. The first 15 minutes cost him \$4 and he has 3 hours and 10 minutes left, which is  $(12 \times 3 = \$36) + 10$  minutes.

10 minutes are  $\frac{1}{6}$  of an hour, which is  $(\frac{1}{6} \times 12 = \$2)$ .

The total cost will be:  $4 + 36 + 2 = \$42$ .

15. The mall charges 50 cents for the first hour of parking and \$3 for each additional hour until the customer reaches 4 hours, after that the parking fee is \$1 per hour. If a certain customer parked his in the mall for 7 hours and 30 minutes, how much is he going to pay?

\$11.5.

\$12.

\$13.

\$14.5.

\$15.

The best answer is C.

The customer parked for 7 hours and 30 minutes. Divide the problem into parts:

The first hour cost him 0.5 dollars. He has 6.5 hours left.

The next three hours cost him 3 dollars per hour, \$9 in total for that time.

He has  $(7.5 - 4 = 3.5)$  hours left) at a wage of \$1 per hour, it sums up to 3.5 additional dollars.

Sum it all up:  $0.5 + 9 + 3.5 = \$13$ .

16. If  $(0 < X < Y)$ ,  $X$  is an odd number and  $Y$  is a prime number, which of the following can be the value of  $X + Y$  ?

- 11.
- 13.
- 17.
- 10.
- 7.

The best answer is D.

Every prime number except 2 is an odd number. If  $Y = 2$ , then  $X$  must have been 1 because  $X$  is smaller than  $Y$  but this answer doesn't appear among the answers and therefore  $Y$  is odd.

If  $X$  and  $Y$  are both odd numbers, their sum must be an even number. The only even answer is D.

17. It takes Avery 3 hours to build a brick wall while Tom can do it in 2.5 hours. If the two start working together and after an hour Avery leaves, how much time will it take Tom to complete the wall on his own?

- 25 minutes.
- 30 minutes.
- 40 minutes.
- 55 minutes.
- 1 hour and 20 minutes.

The best answer is C.

The output of Avery is  $\frac{1}{3}$  walls in one hour and the output of Tom is  $\frac{2}{5}$  walls in one hour.

The two worked together for one hour, their combined output is  $(\frac{1}{3} + \frac{2}{5} = \frac{11}{15})$  wall and that's the fraction of the wall that they completed together.

Tom has  $(1 - \frac{11}{15} = \frac{4}{15})$  wall left, with his current output it will take him  $(\frac{4}{15}) / (\frac{2}{5}) = \frac{2}{3}$  hours, which is 40 minutes.

18. There are three foam generators in the factory, the first two can generate 14 liters of foam in one hour and the third can generate 18 liters in an hour. The three generators start working together at the same time and after one hour and a half one of the first generators stops working and two hours after that the third generator stops working and only one generator is left. If 5 hours after they all started to work the last generator stops working, how many liters of foam were generated?

- 120.

- 132.
- 146.
- 154.
- 166.

The best answer is D.

In the first hour and a half all the generators worked and produced  $(14 + 14 + 18) \times (1.5) = (69)$  liters.

In the next two hours two generators worked and produced  $(14 + 18) \times (2) = (64)$  liters.

The rest of the time  $(5 - 1.5 - 2 = 1.5)$  hours) only one generator worked and produced  $(14 \times 1.5 = 21)$  liters of foam).

The total amount of foam that was created is  $(69 + 32 + 21 = 154)$  liters).

19. Mike, Jim and Bob are all professional fisherman. Mike can catch 21 fish in one hour, Jim can catch twice as much and Bob can catch 50% more than Jim. If the three started to fish together and after 40 minutes Mike and Bob left, how many fish did the three fishermen catch in one hour?

- 64.
- 72.
- 86.
- 98.
- 112.

The best answer is D.

Mike can catch 21 fish in one hour, Jim can catch 42 fish in one hour and Bob can catch

$(1.5 \times 42 = 63)$  fish) in one hour. 40 minutes is  $2/3$  of an hour.

After  $2/3$  hours they all caught  $(21 + 42 + 63) \times (2/3) = 84$  fish.

In the next  $1/3$  hour that's left, Jim is left alone and so he can catch  $(1/3 \times 42 = 14)$  fish.

The total number of fish that they caught is  $(84 + 14 = 98)$ .

20. A certain church bell rings the bell twice at half past the hour and four times at the hour plus an additional number of rings equal to what ever time it is. How many rings will the clock make from 6:20 in the morning to 10:10 in the morning?

- 32.
- 36.
- 42.

46.

50.

The best answer is D.

Let's start from the top. The first two rings will be at 6:30 from there there'll be 2 rings ever half past the hour until ten, at 7:30, 8:30 and 9:30. That will sum up to 8 rings total.

The bell will also ring at 7:00 8 rings, at 8:00 9 rings, at 9:00 10 rings and at 10 11 rings.

The total number of rings is:  $8 + 8 + 9 + 10 + 11 = 46$  rings.

21. A 75-liter solution of cool-drink is made from 8% jasmine water. If 3 liters of jasmine and 12 liters of water were added to the solution, what percent of the solution is jasmine?

10.3%.

11.5%.

10%.

12.2%.

12%.

The best answer is C.

8% of the solution is made of jasmine, 8% of 70 is 6 liters.

If 3 liters of jasmine and 12 liters of water are added, the amount of the jasmine is 9 liters and the percent of the jasmine out of the entire solution is  $((9)/(75 + 15) = (9/90) = 10\%$ .

22. A 340-liter solution of Kola is made from 88% water, 5% concentrated Kola and the rest is made from sugar. If 3.2 liters of sugar, 10 liter of water and 6.8 liters of concentrated Kola were added to the solution, what percent of the solution is made from sugar?

6%.

7.5%.

9.2%.

10.5%.

11%.

The best answer is B.

$(100\% - 88\% - 5\% = 7\%)$  of the solution is made from sugar, which is  $(0.07 \times 340 = 23.8$  liters).

3.2 liters of sugar were added to the solution, so there are 27 liters of sugar in the solution.

The total volume of the solution is:  $340 + 3.2 + 10 + 6.8 = 360$  liters.  
( $27 / 360 = 3/40$ ), which is 7.5% percent.

1. If Peter spends 460 lirettas on three pairs of shoes, how much did the least expensive shoes cost?

(1) The ratio between the most expensive shoes to the least expensive shoes is 3 to 1.

(2) The ratio between the least expensive shoes to all the other ones is 1 to 5.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

We are to find what is the price of the least expensive among three shoes. Statement (1) gives us the ratio between the most expensive shoes and the least expensive one but that's not sufficient because the median is not unequivocal and it could be anything.

Statement (2) is sufficient. If the ratio between the least expensive to all the shoes is 1 to 5 then we can calculate the price of the least expensive shoes,  $(460/6)$ .

Therefore statement (2) is sufficient by itself.

2. What is the average price of three different DVD's?

(1) The first DVD costs 125 dollars.

(2) The sum of the prices of the second and the third DVD's is 300 dollars.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

Statement (1) gives us information about the first DVD only and therefore it's not sufficient.

Statement (2) gives us information only about two of the DVD's and therefore this statement by itself is not sufficient either.

Combining both statements we have enough data to calculate the average. If X, Y and Z are the prices of the three DVD's, statement (1) tells us the value of X and statement (2) the value of the other two so we can calculate the average:  $(X+Y+Z)/3$ .

Therefore, the two statements combined are sufficient.

3. What percent of 20 is Y?

(1) 50 percent of Y is 5.

(2) Y percent of 200 is 20.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

The question, in other words, is asking what is the value of  $(Y/20 \times 100)$ . So all we need to find out is if the value of Y is known. Statement (1) gives us Y explicitly, its 10.

Statement (2) is also sufficient, it tells us that Y is also equal to 10.

Both statements are sufficient by themselves and the answer is D.

4. How much is Y percent of X?

(1) 400% of Y is 90.

(2) X percent of Y is 25.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

Statement (1) gives us data on Y only regardless to X and therefore it's insufficient.

Statement (2) tells us how much is X percent of Y. Make up numbers,  $X = 25$  and  $Y = 100$ .

X percent of Y is 25 but we also know how much is Y percent of X, 100 is 400% of 25 and therefore this statement is sufficient by itself.

5. Did it take Reese more than 24 minutes to bake the carrot cake?

(1) Reese spends more than 1260 seconds on the cake.

(2) Reese spends less than 1560 seconds on the cake.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

Define  $X$  as the time Reese spends on the cake.

Statement (1) tells us that  $X > 1260$  seconds, which is 21 minutes and so this statement is insufficient because  $X$  can be 22 or even 28 and we cannot determine for sure that  $X$  is smaller or bigger than 24.

Statement (2) tells us that  $X < 26$  and it's not sufficient because  $X$  can be either 25 or 21.

Combining both statements wouldn't help ( $21 < X < 26$ ) because  $X$  can be bigger than 24 (25) or smaller (22).

6. Did Sammy drive more than 21 kilometers last night?

(1) Sammy drove more than 20,000 meters last night.

(2) Sammy drove less than 20,500 meters last night.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

Define  $Y$  as the number of kilometers that Sammy drove last night. We are asked if  $Y > 21$ .

Statement (1) tells us that  $Y > 20$  kilometers which is not sufficient by itself because  $Y$  can be smaller or bigger than 21 kilometers.

Statement (2) tells us that the number of kilometers that Sammy drove is less than 20.5 and therefore this statement is sufficient by itself.

8. One person won the lottery this week, what is the probability that it was a woman over the age of 40?

(1) 55% of all the lottery participants are male.

(2) 60% of all the lottery participants are over the age of 40.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

We need to know what is the probability that one of the lottery participants is a woman over the age of 40. Statement (1) tells us that

45% of the participants are woman and statement (2) tells us that 60% of the participants are over the age of 40. Combine both statements, we still lack some sufficient information about the cross-link between the groups.

9. If a kid is chosen randomly from his class, what is the probability that he would have blue eyes?

(1) The class is in Denmark, where 95% of the population has blue eyes.

(2) 5% of the class has brownish eyes.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

We need to know the ratio between the numbers of blue-eyed kids in the class to the others.

Statement (1) gives us data about the average population but not specifically on the class.

Statement (2) implies that 5% have brown eyes, but that doesn't necessarily mean that others have blue eyes, they could have green eyes as well.

More sufficient data is required.

10. In a bulb factory there are different kinds of bulbs, what is the probability that a bulb chosen randomly is a halogen?

(1) There are three times as many halogens than any other bulb in the factory.

(2) The ratio between the halogen to all the other bulbs is 2 to 7.

(a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

(b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

(c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

(d) Either statement BY ITSELF is sufficient to answer the question.

(e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is B.

We are asked what is the ratio between the halogen to the not.

Statement (1) tells us that halogen can be found 3 times more often in the factory. The problem with this statement is that we don't know 3 times of what?

Statement (2) is sufficient, it gives us enough data to solve the question. If the ratio is 2:7 then  $\frac{2}{9}$  is the probability of choosing a halogen at random.

1. How many people are in the van?

(1) The average weight of each person is 75 Kg.

(2) The people and the van together weigh 5000 Kg.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

STATEMENT (1) alone is not sufficient. We still need the total weight of the people: then we can divide by the average weight to obtain the number of people. STATEMENT (2) tells us how much the people and the van together weigh, but we don't know how much the people weigh. So STATEMENTS (1) and (2) together are not sufficient. More sufficient data is required.

2. How many kids are spinning on a carousel?

(1) The average weight of each kid is 25 Kg.

(2) The kids and the carousel together weigh 400 Kg.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

STATEMENT (1) alone is not sufficient. We still need the total weight of the kids: then we can divide by the average weight to obtain the number of kids. STATEMENT (2) tells us how much the kids and the carousel

together weigh, but we don't know how much the kids weigh. So STATEMENTS (1) and (2) together are not sufficient. More sufficient data is required.

3. If  $(0 < X < 30)$ , what is the value of X?

(1) When X is divided by 6 the remainder is 0.

(2) When X is divided by 12 the remainder is 0.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) by itself is insufficient because the possibilities are many: 6, 12, 18 and 24.

Statement (2) by itself is insufficient because there are more than one options: 12 and 24.

Even if we combine both statements, still we have two options and X is not distinct.

4. If  $(0 < X < 70)$ , what is the value of X?

(1) When X is divided by 6 the remainder is 0.

(2) When X is divided by 11 the remainder is 4.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) by itself is insufficient because the possibilities are many: 6, 12, 18, ....

Statement (2) by itself is insufficient because there are more than one options: 15, 26, ...

When we search among all the numbers from statement one that are divisible by 6, we can see that only one of them will give a remainder of 4 when divided by 11 and that would be 48.

Therefore, the crosslink between the two statements is sufficient.

5. How much was the original price of a car, which was sold for \$25,000?

(1) The original price was more than half of the price it was sold.

(2) The car has appreciated in value by 35% from its original value.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is B.

Statement (1) is insufficient since it doesn't give us exact information about the original price, more than half is not accurate enough. Statement (2) is sufficient since it tells us that the original value is 65% of the price it was sold.

6. If a full glass of water holds 0.236 liters, how many liters are there in one pint?

(1) One pint is  $\frac{1}{8}$  of a gallon.

(2) One gallon is 3.78 liters.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

The data about the glass of water is irrelevant, all you're asked is how many liters are there in a pint.

Statement (1) is insufficient because we are told the conversion from pint to gallons only.

Statement (2) is insufficient because we are told the conversion from gallons to liters only and we have no connection to pints.

Combine both statements so you know how many gallons is one pint and how many liters are in  $\frac{1}{8}$  of a gallon. Both statements taken together are sufficient.

7. One cubic centimeter is equal to 0.001 liters, is a volume of a rectangular tank larger than 0.001 liters?

(1) The rectangular tank holds 0.3 teaspoons. There are 0.0049 liters in one teaspoon.

(2) The dimensions of the tank are 0.5 x 0.6 x 4 centimeters.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is D.

Statement (1) gives us the amount of teaspoons that the tank holds and it gives us that conversion between teaspoons and liters. This statement is sufficient.

Statement (2) is also sufficient since we are given the dimensions of the tank, we can calculate the volume and compare it to the volume of one cubic centimeter.

8. A television set cost \$65 in 1981, did it cost more than \$65 in 1983?

(1) In 1981, the average family had to work three weeks in order to save up enough money to buy a television set.

(2) In 1983, the average family had to work two weeks in order to save up enough money to buy a television set.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

STATEMENTS (1) and (2) together are insufficient. You need to know whether the wages of the average family changed. 3 weeks of work in 1981 could be worth more or less than 2 weeks of work in 1983. More sufficient data is required.

9. Last year, a bottle of milk cost \$1. Does it cost more than \$1 today?

(1) Last year, the average worker had to work 10 minutes to pay for a bottle of milk.

(2) Today, the average worker had to work 8 minutes to pay for a bottle of milk.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

STATEMENTS (1) and (2) together are insufficient. You need to know whether the wages of the average worker changed. 10 minutes of work last year could be worth more or less than 8 minutes today.

10. Is the line to the rollercoaster getting longer or shorter by the minute?

(1) Each rollercoaster can process 48 people in 4 minutes.

(2) Every two minutes, 20 people join the line.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

STATEMENT (1) tells us the rate at which people are getting out of the line, but we need to know if anyone is joining the line to be able to answer the question. STATEMENT (2) gives us this information. Therefore the two together are sufficient to see that the net gain in people on the line is 2 per minute; the line is getting shorter.

11. There is a traffic jam in the freeway, is the number of cars getting bigger by the minute?

(1) 25 cars escape the traffic by exiting the freeway at the nearest exit every minute.

(2) 40 new cars get stuck in the traffic jam every two minutes.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

STATEMENT (1) tells us the rate at which people are getting out of the traffic jam, but we need to know if anyone is joining the line to be able to answer the question. STATEMENT (2) gives us this information. Therefore the two together are sufficient to see that the net gain in number of cars on the line is 5 per minute; the number of cars is getting smaller.

12. Did the value of the house grow this year?

- (1) If the neighborhood becomes more crowded the value of the house drops.
  - (2) This year the neighborhood has gotten less crowded yet a new railway was built nearby.
- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
  - b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
  - c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
  - d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) gives a casual link between the value of the house and the neighborhood, yet no data on the neighborhood was given in this statement. Statement (2) tells us that the neighborhood has gotten less crowded and so the value of the house grew. Statement (2) also tells us about a new railway that was built nearby but no link has been given to us about the connection between the value of the house and the rails.

Both statements, taken together are sufficient.

13. Did the average cost of flying abroad decline this year?

(1) If the geo-political situation in the area is evolving, the average cost of flying abroad declines.

(2) The geo-political situation in the area is not evolving, yet more people fly this year than the previous years.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) gives us a link between the cost of flying abroad and the geo-political situation.

Statement (2) tells us the geo-political situation and thus we know the changes in the average cost of flying abroad. The second piece of information given in statement (2) is irrelevant, we are not told about a connection between the number of people and the price of flying abroad.

Both statements, taken together, are sufficient.

14. Derrick is flying a small Cessna light plane for 2 hours. What is Derrick's average flying speed in miles per hour?

(1) Derrick flew 250 miles.

(2) Derrick's top speed was 200 miles per hour and his low speed was 100 miles per hour.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

The average flying speed can be found by dividing the total distance by the total time.

Statement (1) gives us the total distance and the total flying time is given to us in the question and therefore this statement is sufficient.

Statement (2) is irrelevant, the changes in velocities during the time interval don't affect the average speed. And therefore this statement is insufficient.

15. Fred drove from city A to city B. What is Fred's average speed?

(1) Fred drove from city A to city C during a 4 hour period and from city C to city B during a 2-hour period.

(2) The distance between city A and city B is 600 miles.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) presents us with another city, which we don't know her relative location from city A or B. City C can be between city A and B or it can be somewhere else.

Statement (2) tells us the distance between city A and B yet it doesn't give us any of the other distances. The average speed is calculated by dividing the total distance (which is unknown) by the total travel time (which is known).

More sufficient data is needed.

16. What is the sum of the digits of a two digits number?

- (1) The sum of the digits is a number, which is divisible by 4.
  - (2) The two-digit number is a prime number.
- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
  - b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
  - c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
  - d) Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) is insufficient since there are plenty of double-digit numbers who fit this statement.

Statement (2) is insufficient since there are plenty of double-digit prime numbers.

The combination of both statements is still not sufficient.

Take 31 and 71: they both fit statement (1) and (2) but each has a different sum of digits.

17. How many liters of lime are needed in order to paint the entire wall of a castle?

(1) The length of a wall is 45 yards.

(2) The width of the wall is 50% of the length.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Neither statement defined how many liters are needed in order to paint a certain area of the wall and therefore we can't convert the area into liters of paint.

18. If one Pint is  $\frac{1}{8}$  of a gallon, how many pints are needed in order to fill a large hogshead?

(1) The hogshead is a cylinder with a diameter of 25 inch.

(2) The height of the hogshead is 100 inch.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Neither statement gave us the conversion factor from inches cubed to gallons or pints.

Therefore, we can only calculate the volume of the hogshead but we can't convert it into pints.

19. Rick and Nick are sitting in their cars waiting in line to be served at the drive-in café. How many cars are in the line?

(1) There are 13 cars between Rick and Nick.

(2) There are 31 cars in front of Rick and 24 cars behind Nick.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Using both statements combined, we cannot determine who is in front, who is Rick further in the line than Nick or the opposite. Because of this we have two options for the number of cars.

The first (If Rick is in front):  $31 + 13 + 24 = 68$ .

The second (If Nick is in front):  $18 + 13 + 11 = 42$ .

More sufficient data is required.

20. Is  $A > B$  ?

(1)  $A^2 > B^2$ .

(2) B is positive.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Use both statements, find two sets of numbers that fit the statements yet give a different result.

Take  $A = 2$ ,  $B = 1 \rightarrow$  the numbers fit the statements and  $A > B$ .

Take  $A = -2$ ,  $B = 1 \rightarrow$  the numbers fit the statements and  $B > A$ .

Therefore more sufficient data is required.

21. Is the area that is blocked between the line  $Y = AX + B$ , the Y-axis and the X-axis bigger than C?

(1)  $A = 2, B = -1$ .

(2)  $C = 10$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Using both statements, the line is  $Y = 2 - X$  and the area is 10.

Draw a rectangular axis system and draw a line.

You can see that the blocked area is a triangle with an area of  $(2 \times 2 / 2 = 2)$  and therefore the area of the blocked area is smaller than 10.

Only if you use both statements together, you can answer the question.

22. In which of the following lines:  $Y_1 = A_1X + B_1$ ,  $Y_2 = A_2X + B_2$ , is the angle X bigger?

(1) X is the angle between the line and the X-axis.

(2)  $A_1 = 2A_2$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Both statements are sufficient.

Statement (1) defines the angle  $X$  of each line.

Statement (2) gives us the relevant data on each of the lines, the angle  $X$  is determined by the coefficient of  $X$ , thus  $A_1$  and  $A_2$ . The line with the bigger coefficient is the one with the bigger angle  $X$ .

23. If  $A$  stamps can be bought with  $B$  dollars, how many stamps can be bought with 10 dollars?

- (1)  $B$  dollars are more than enough to buy 20 stamps.
- (2)  $B = 5$ .
- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) is not accurate, it tells us that B dollars are more than enough to buy 20 stamps, in other words, the number of stamps that can be bought with B dollars is larger than 20.

Statement (2) completes statement (1) but still both statements are insufficient together.

All we know from the statements is that more than 20 stamps can be bought with 5 dollars.

More sufficient data is required.

24. What is the value of  $(X + Y)$ ?

(1) Y is 20% more than X.

(2)  $X = 120$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) is insufficient by itself since we only know that  $Y = 1.2X$  and the expression required is  $(X + Y)$ , which becomes  $(X + 1.2X)$ .

Using statement (2) combined with statement (1), we know that the value of the expression becomes

$(120 + 1.2 \times 120 = 144)$  and therefore both statements, taken together, are sufficient.

25. What is the value of  $(X + Y)/X$ ?

(1) Y is 35% more than X.

$$(2) Y = 88.$$

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

The expression can be written as:  $(X + Y)/X = 1 + Y/X$  and therefore we need the ratio only.

Statement (1) is sufficient because it gives us the ratio between Y and X,  $Y = 1.35X$ .

Statement (2) is insufficient by itself since it supplies no data on the variable X.

26. How long will it take Jim to wax his car?

- (1) It would take Jim and Mike 40 minutes to wax Jim's car.
  - (2) It would take Mike 1 hour and 20 minutes to wax his car.
- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
  - b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
  - c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
  - d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) gives us the output of Jim and Mike together on Jim's car only.

Statement (2) gives us Mike's output on his car and not Jim's car and therefore we can't conclude anything about the output of Mike on Jim's car. More sufficient data is required.

27. How much time will it take Gus to deliver 350 newspapers on his bikes?

(1) Tom and Gus, working together each on his bike, can deliver 100 newspapers in one hour.

(2) Tom can deliver 25 newspapers in 30 minutes on Gus's bike.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) gives us the output of Gus and Tom, together, in order to answer the question we need to know the output of Tom on his bike alone. Statement (2) gives us almost that, it gives us the output of Tom on Gus's bike and as far as we are concerned, his bike could be a lot faster or slower and thus the output will change accordingly.

More sufficient data is required.

28. How much time will it take two different fire extinguishers to shut down a level 3 fire?

(1) The first fire extinguisher can shut down a level 3 fire in 45 seconds.

(2) The second fire extinguisher can shut down a level 3 fire in one minute and 20 seconds.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) gives you the output of the first fire extinguisher, which is  $\frac{1}{45}$  fires in a second.

Statement (2) gives you the output of the second fire extinguisher, which is  $\frac{1}{110}$  fires in a second.

Combine the two statements, we know the total output of the two extinguishers and so we can easily calculate the time it would take them to shut down the fire.

29. What is the average number of questions that Laura can write in three days if on the first day she wrote 20 questions?

(1) Every passing day the number of questions that Laura writes grows by 20%.

(2) On the other two days, Laura wrote 53 questions.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is D.

Laura writes questions over a 3 day period.

In the first day Laura wrote 20 questions.

Statement (1) tells us that on the second day she wrote  $(1.2 \times 20 = 24)$  questions and on the third day she wrote  $(1.2 \times 24)$ . This statement is sufficient in order to calculate the average.

Statement (2) is also sufficient, it gives us the sum of questions that Laura wrote in the other 2 days and therefore the average can be easily calculated.

Each statement is sufficient on its own.

30. How many pictures exactly did Sammy develop on Saturday?

(1) Sammy gave away 3 films for development.

(2) There are approximately 36 pictures in one film.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

The question asked explicitly for an exact number of pictures.

Statement (1) is not sufficient by itself because it gives us no data on the pictures.

Statement (2) completes statement (1) but not accurately as the question required and therefore more sufficient or accurate data is required.

31. How long exactly did it take Claudia to drive from the beach house to her green house?

(1) Claudia drove at a constant speed of 55 miles per hour.

(2) The approximate distance between the beach house and the green house is 200 miles.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

We are specifically asked about the exact time and not an approximation.

Statement (1) gives us the exact traveling speed of Claudia.

Statement (2) gives us the approximate distance between the two houses and therefore we can only calculate the approximate duration and not the exact one.

More accurate data is required.

1. Two giant identical poles have been planted in the ground. One of the poles was planted dipper than the other pole. The shadow of pole A is 10 meters long and the shadow of pole B is 8 meters long. How tall is pole B?

(1) Pole A is hoisted 14 meters in the air.

(2) Pole B is located 2 meters from pole A.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d)Either statement BY ITSELF is sufficient to answer the question .

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

The shadows are proportioned to their height.

Statement (1) gives us the height of pole A and so by using the proportion we can calculate the height of pole B. The proportions are  $10/14 = 8/H_b$ , from that we know the height of pole B.

Statement (2) is insufficient because the distance between the poles is irrelevant to the question and it doesn't contribute anything.

2. A new taxi service charges money according to the weight of the passengers and their luggage or according to the distance they wish to travel. If the taxi service charges the highest among the two, according to what will the Smith's pay, weight or distance?

(1) The total weight of the Smith's family including the luggage is 300 Kg.

(2) The total distance, which the Smith's wish to travel is 100 Km.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .
- d) Either statement BY ITSELF is sufficient to answer the question .
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

We are given two possibilities of charging fee, according to two different criteria's but both statements don't provide us with the conversion factor from weight to amount of money or from distance to amount of money. More sufficient data is required.

3. Is the square root of A an integer?

- (1) The last digit of A is 8.
- (2) A is divisible by 6.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .
- d) Either statement BY ITSELF is sufficient to answer the question .
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

If you square each digit  $\{0, 1, 2, \dots, 8, 9\}$ , you will see that the only possible last digits for a square are 0, 1, 4, 5, 6 and 9. Thus, if the last digit of  $A$  is 8,  $A$  cannot be a square. So the square root of  $A$  is not an integer. So statement (1) by itself is sufficient. Since 36 is divisible by 6 and its square is an integer, this statement is insufficient by itself.

4. How many Popsicles can Amy and Megan eat in 30 minutes?

(1) Megan eats twice as fast as Amy.

(2) Megan can eat 5 more Popsicles than Amy in 15 minutes.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) is insufficient by itself because it only gives us the ratio between the two and we need a concrete number, which statement (2) provides. Altogether we have two equations with two unknowns and the solution is feasible by using both statements.

5. If there are 350 words in each page, how many pages can Susan type in one hour?

(1) There is an average of 30 twenty-word lines in one page.

(2) Susan can type 15 twenty-word lines in two minutes.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .
- d) Either statement BY ITSELF is sufficient to answer the question .
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is B.

We are given the amount of words per one page, and we are asked how many pages can be typed in one hour. In order to be able to answer this question, we need to know the rate of Susan's typing.

Statement (2) gives us just that, it tells us that Susan can type  $(15 \times 20 = 300)$  words in two minutes and therefore this statement is sufficient by itself.

Statement (1) is insufficient because it only gives us an average data of 20 words lines with out any correlation to Susan's rate of typing.

6. A CNC machine produces metal parts through the machining process. How many aluminum cubes can the machine produce in 40 minutes?

(1) The CNC machine produces 3 steel cubes in 20 minutes.

(2) The rate in which the machine produces steel cube is three times slower than the rate of producing aluminum cubes due to the lower density of aluminum relative to steel.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

We are to find the rate in which the CNC machine produces aluminum cubes and then multiply it by the required time.

Statement (1) is insufficient because it gives us the rate of producing steel cubes, which is a different type of metal. Statement (2) tells us that the rate of production is 3 times quicker in aluminum and therefore using both statements together, we can calculate the necessary rate.

7. Is the average of  $X$  consecutive numbers odd?

(1) The first number in the series is odd.

(2) The sum of the numbers is odd.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is B.

Statement (1) is insufficient by itself, take  $X$  as 2: if the first number is odd, the sum of the two numbers is odd. Take  $X$  as 3: if the first number is odd, the sum of the three numbers is even.

Statement (2) tells us that the sum of the numbers is odd and therefore the median must be odd.

If the median is odd the average of these numbers is also odd because that means that there is an even amount of even numbers and an odd amount of odd numbers.

This statement is sufficient by itself.

8. In a group of 200 foreign workers, how many workers can read and write?

(1) 80 workers can write.

(2) 90 workers can read.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) is insufficient because it tells us nothing about workers who can read.

Statement (2) is insufficient because it tells us nothing about workers who can write.

Combine the two, still you don't know if there is any overlapping between the two groups and thus more sufficient data is required.

9. In a group of 350 academics, how many are either British or French?

(1) There are 100 British in the group.

(2) There are 180 French in the group.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .
- d) Either statement BY ITSELF is sufficient to answer the question .
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

The question asks, how many are either British or French. In other words, how many people are British or French. Statement (1) is insufficient because it tells us nothing about the French. Statement (2) is insufficient for the same reason, only that it doesn't say anything about the British. Combine the two statements, you know that  $(100 + 180 = 280)$  is the number of people that are either British or French.

10. There are 45 people on the quay, what is the most and the least number of people that are both sailors and erudite?

(1) The number of sailors is 28.

(2) The number of erudite people is 30.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .
- d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Use statements (1) and (2) together. You can see that the number of people in each of the groups together sums up to a number, which is more than 45 and therefore there must be an overlapping between the groups. The maximum number of people in both groups is the size of the smaller group, thus 28 people.

The minimum number of people in both groups is  $(28 + 30 - 45 = 13)$ . Both statements, taken together, are sufficient.

11. 47 people are standing behind a large dais, what is least number of people, behind the dais, that are blonde haired and over 6 feet tall?

(1) The number of blond people is 35.

(2) The number of people who are less than 6 feet tall is 25.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Use statements (1) and (2) together. You can see that the number of people in each of the groups together sums up to a number, which is more than 47 and therefore there must be an overlapping between the groups. The maximum number of people in both groups is the size of the smaller group, thus 25 people.

The minimum number of people in both groups is  $(25 + 35 - 47 = 13)$ . Both statements, taken together, are sufficient.

12. What is the value of X?

(1)  $4X + 18 = 2X + 22$ .

(2)  $8/X + 14 = 6/X + 16$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is D.

We ought to find the value of the unknown X.

Statement (1) is sufficient because it presents us an equation where the only unknown is X.

Statement (2) is also sufficient for the same reasons as the first one and therefore each statement is sufficient by itself.

13. If X and Y are integers, what is the value of Y/X?

(1)  $X^3 + X^2 + 2X = 0$ .

(2)  $Y - 4 = 0$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

In order to find the value of  $Y/X$ , you need to use both statements to find each of the variables.

Statement (1) gives only one possible root for  $X$ , the expression in statement (1) can be written as

$X(X^2 + X + 2) \rightarrow$  the only solution for  $X$  which is an integer is 0, the other two are complex numbers.

Statement (2) tells us that  $Y = 4$ .

The value of  $Y/X$  is undefined, because the denominator is zero and therefore both statements are not sufficient in order to determine the value of  $Y/X$ .

14. If  $X$  and  $Y$  are integers, what is the value of  $XY$ ?

(1)  $X^3 - 3X^2 - 2X - 8 = 0$ .

(2)  $4 + 3Y = 2Y + 8$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) can be written as  $(X - 4)(X^2 + X + 2) = 0$ .

The roots of this equation are one integer and two complex numbers, which you should pay no attention to since you were told that  $X$  is an integer.

Statement (2) is a simple equation,  $Y = 4$ .

The value of the expression  $XY$  is 16.

Both statements, taken together, are sufficient to answer the question.

15. What is the value of  $AB$ ?

(1)  $A + 4 = 3A - 8$ .

(2)  $B^2 - 12B + 36 = 0$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) is insufficient by itself. The value of  $A$  from this statement is 6.

Statement (2) can be written as  $(B - 6)^2 = 0$  and therefore the value of  $B$  is 6.

Combine both statements to calculate the value of the required expression  $AB$ .

17. How many days will it take two window cleaners to clean the entire 30 stories building?

(1) The first window cleaner can clean 15 windows in 10 minutes.

(2) The second window cleaner can clean twice as much as the first cleaner in 15 minutes.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Both statements, taken together, are not sufficient. There is no data on how many windows are in each story of the building and so we can't calculate the time it would take the two cleaners to finish the job.

More sufficient data is required.

18. How long will it take until Andy and Tim to finish swimming 1500 meters?

(1) Andy can swim at a constant rate of 100 meters in one minute.

(2) Tim can swim faster than Andy.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

There is a trick to this question, the time until both swimmers finish swimming 1500 meters is the time it takes the slower swimmer among the two to finish swimming.

Statement (1) tells us the rate of Andy, we can calculate the time it would take him to finish 1500 meters. This statement is insufficient by itself since we don't know that Andy is slower than Tim.

Statement (2) completes statement (1) by telling us that Tim is faster and so the time is determined by Andy's time.

Both statements, taken together, are sufficient.

19. There are three sprinters on a racetrack. How much time will it take all three to finish an 800 meters race?

(1) The first runner can run the fastest, he runs at a 110% of the slowest runner.

(2) The slowest runner runs at a constant speed of 7 meters per second.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

The trick to this question is to understand that the time it would take them all to finish the track is the time it would take the slowest sprinter to finish the track.

Statement (1) tells us that the first sprinter is the fastest among the three. Statement (2) tells us that the third sprinter runs the slowest and therefore they determine the time it would take all of them to finish the track. The rate of the slowest sprinter is given and so this answer is solvable.

20. How many hours will it take ship A and ship B to transfer 50 cars from one side of the river to the next?

(1) Ship A can transfer 5 cars in 10 minutes.

(2) Ship B can transfer twice as many cars in half the time.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d)Either statement BY ITSELF is sufficient to answer the question .

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

This is a simple rate problem. In order to find the time it will take both ships to finish the job, we need to know the output of each ship.

Statement (1) gives us the output of ship A, which is 30 cars per hour.

Statement (2) gives us the output of ship A, which is 120 cars per hour.

Both statements, taken together, are sufficient.

21. Each of the 850 local villagers in Lucia owns either a Golden Retriever or a Bernard. How many people own both?

(1) The number of villagers who own a Golden Retriever only is 300.

(2) The number of villagers who own a Bernard only is 280.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Each one of the villagers, according to the question, has to own at least one of the two dogs.

Statement (1) is insufficient because it says nothing about the Bernard owners.

Statement (2) is insufficient because it says nothing about the Golden Retriever owners.

Combine the statements, all the information we need is present,  $(800 - 300 - 280)$  is equal to the number of people who own both races of dogs.

22. The town rules in Kid-Town require each house to have at least a ping-pong table or a soccer-table. If there are 50 houses in Kid-Town, how many houses carry both types of tables?

(1) The number of houses that have a ping-pong table only is 20.

(2) The number of houses that have a soccer table is 40.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Pay attention to the statements, (1) gives you the exact number of houses who have a ping-pong table only as opposed to the other statement, which tells you that 40 houses have a soccer-table.

There are two possible answers to the question: there are  $(40 + 20 - 50 = 10)$  houses with both tables in them or there are 20 houses (the size of the small group).

The answer is not distinct and therefore more sufficient data is required.

23. An air-balloon is filled with air, how long will it take to fill it assuming that its volume is 30 meters cubed?

(1) Every minute the pump fills 1 meter cubed and emits one fifth of that amount.

(2) The net airflow to the balloon is 0.8-meter cube per minute.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is D.

The volume is given in the question and so we ought to find the rate of fulfillment.

Statement (1) tells us that every minute 1 meter cubed is going in and 0.2 is going out, making a total of 0.8 meter cube air going in per minute.

Statement (2) gives us right away the net flow of air going in to the balloon.

Therefore, each statement is individually sufficient.

24. A waiter earns a basic amount of 500 pounds per month regardless of her tips. How much did the waiter receive on tips during the month of May?

(1) On May, the waiter earned a total amount of money that was 150% of the basic.

(2) The waiter receives an average amount of 250 pounds on tips per month.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

We need to find the amount of money that the waiter earned on tips.

Statement (1) tells us that the total amount money earned is 150% of the basic, therefore the tips are 50% of 500 pounds, thus 250 pounds. This statement is sufficient.

Statement (2) is insufficient since the amount of tips earned on may can be over or under the average and so we can't pinpoint the exact amount.

25. Willy the wale receives sugar cubes every time he does something exquisite. How many sugar cubes did Willy get on yesterday's show?

(1) Today, Willy performed the same show as yesterday.

(2) Today, Willy received 11 sugar cubes.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not .

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not .

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient .

d) Either statement BY ITSELF is sufficient to answer the question .

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

The question asks about the number of cubes that Willy received on yesterday's show, which is dependent on his performance.

Statement (1) tells us that Willy did the same show but it didn't mention how did he perform, did he do the same number of exquisite acts? This statement is insufficient.

Statement (2) only completes statement (1) by telling us how many cubes of sugar he received.

More sufficient data is required.

1. Last year, what was the average (arithmetic mean) number of cookies consumed by a person in the Swanson family?

(1) Last year, the family consumed 45 boxes of cookies.

(2) Each box of cookies contains 12 delicious cookies.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d)Either statement BY ITSELF is sufficient to answer the question.

e)Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

We are required to find the number of cookies that each person consumed.

Statement (1) and (2) tell us that  $(45 \times 12)$  cookies were consumed by the entire family last year.

This data is insufficient because we don't know how many members are in the Swanson family.

More sufficient data is required.

2. What was the maximum wind speed on January 1998?

(1) The average (arithmetic mean) of the maximum monthly wind speed between March 1997 and January 1998 is 35 knots, which was higher by 12 knots from the average (arithmetic mean) of the maximum monthly wind speed between February 1997 and December 1997.

(2) The maximum wind speed on January 1998 was 8 knots higher than the maximum wind speed on February 1997.

a)Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b)Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c)Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

The question doesn't tell us much, go straight to the statements.

From statement (1) we can find the sum of the wind speeds between March 1997 and January 1998, which is  $(11 \times 35 = 385 \text{ knots})$ . The average of the other group of months is  $(11 \times (35 - 12) = 253)$ .

The difference between the two numbers is the sum of the maximum in January 1998 and February 1997. Define J as the maximum on January and F as the maximum on February, you can write the following equation:  $J + F = (385 - 253 = 112)$ . J is what we're looking for.

Statement (2) can be written as  $J - F = 8$ .

We have two simple equations with two unknowns, both statements together are sufficient.

3. Is  $A^5 > A^2$ ?

(1) A is an integer.

(2) A is positive.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

There are 3 cases in which the inequality is not true: when A is negative, when A is a fraction and when A is equal to 1. Statements (1) and (2)

cover up two of the cases above, yet  $A=1$  fulfills both statements and still the inequality will not be true.  
More sufficient data is required.

5.  $X$ ,  $Y$  and  $Z$  are three numbers. If  $Y = 5$ , what is their sum?

(1)  $X - Z = 10$ .

(2)  $Z - Y = 15$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

We need to find the value of  $X+Y+Z$ .  $Y$  is given to us so we need the value of  $(X+Z)$ .

Statement (1) is insufficient by itself since we are given the value of  $(X - Z)$  and not  $(X + Z)$ .

From statement (2) we can find the value of  $Z$ , and from there return to statement (1) and find the value of  $X$ . Both statements, taken together, are sufficient.

6.  $X$ ,  $Y$  and  $Z$  are three positive integers. If  $Z = 2$ , what is their sum?

(1)  $X - Y = 5$ .

(2)  $3Y + 15 = 3X$ .

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

We need to find the value of  $X + Y$  since  $Z$  is already given to us.

Statement (1) is insufficient since we need the sum of  $X$  and  $Y$ .

Statement (2) can be written as:  $3X - 3Y = 15 \rightarrow X - Y = 5$ , you can see that both statements are the same and therefore more sufficient data is required.

7. Bony and Clyde, each had to translate half of a new blockbuster movie. If Bony finished her half after two hours and 20 minutes, how long will it take Clyde to finish his half?

(1) Bony can translate 3 lines of speech in 1 minute, which is one and a half faster than Clyde.

(2) The movie contains 840 lines of speech.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

We are told that each of the translators has to finish the same job (each has to finish one half).

Statement (1) tells us that Bony can translate 1.5 faster than Clyde and therefore it would take him 1.5 times more than Bony's time. This statement is sufficient, the data about the specific translation rate is irrelevant and so is statement (2).

8. Jean and Jordy each had to wash half of a rectangular floor. If Jean finished his part of the job after 45 minute, how long will it take Jordy to finish his half?

(1) Jean can wash 10 meters square in 5 minutes, which is twice as fast as Jordy.

(2) The area of the rectangular floor is 180 meters squared.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is A.

We know how much time it took Jean to wash the floor and we need Jordy's time.

Statement (1) tells us that the rate of Jean is double than the rate of Jordy and therefore it will take him twice as long to wash his half of the floor. The numbers that describe the rate of Jean are irrelevant to the question and so is statement (2) .

9. 35% of the students in Cambridge study engineering. How many students in Cambridge study Aerospace engineering with honors?

(1) 18% of the total number of students in Cambridge, which is 10,000, study with honors.

(2) One fifth of the honor students study Aerospace engineering.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) tells us that  $(0.18 \times 10,000 = 1,800)$  student's study with honors.

Statement (2) tells us that  $(0.2 \times 1,800 = 360)$  is the number of students that study Aerospace engineering with honors.

Both statements, taken together, are sufficient.

10. Is Y even?

(1)  $2Y$  is even.

(2)  $Y^2$  is even.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) by itself is insufficient because every number that is multiplied by 2 will result in an even number. Statement (2) is also insufficient by itself since numbers like  $\sqrt{6}$  fulfill this statement although it's not even. Combine the statements and Y must be an even number.

15. If A is a prime number, what is the value of A?

(1)  $0 < A < 10$ .

(2)  $(A - 2)$  is divisible by 3.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) narrows down A to be one of : 1, 2, 3, 5 and 7. This statement is insufficient.

Statement (2) is also insufficient, there are a lot of numbers that fulfill this statement, like 17, 23 and many more. Even after you combine both statements, there are still two options: 5 and 2.

Both, when you subtract 2 you get a number that is divisible by 3.

16. If B is an odd number, what is the value of B?

(1)  $20 < B < 30$ .

(2)  $(B - 1)$  is divisible by 3.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) narrows down B to the following numbers: 21, 23, 25, 27, 29. This statement is insufficient by itself. Statement (2) is also insufficient by itself since more than one numbers fulfill the statement. If you combine the two statements, you will narrow down B to be 25. Therefore both statements, taken together, are sufficient.

19. As the new basketball season reopened, 40 players received either a yellow ball or a red ball as a present. How many basketball players received the yellow ball as a present?

(1) 16 players received the red ball.

(2) 50% more players received the yellow ball than players who received the red ball.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is D.

Statement (1) is sufficient since it gives us the number of players who received red balls. The number of players who received yellow balls is  $(40 - 16 = 24)$ .

Statement (2) is sufficient, Define X as the number of players that received a red ball.

$X + 3X/2 = 40 \rightarrow X = 16$  and so  $(40 - 16 = 24)$  is the number of players who received a yellow ball.

20. If the sum of six numbers is between 135 and 164, then the average (arithmetic mean) of the six numbers could be which of the following?

15.4.

20.5.

25.5.

31.25.

32.5.

The best answer is C.

Define X as the sum of all the six numbers,  $135 < X < 164$ .

The average of the six numbers, using the average formula, is  $X/6$ .

Divide both sides of the equation by 6:  $135/6 < X/6 < 164/6 \rightarrow 22.5 < X/6 < 27.33$ .

The average has to be in that range and therefore the only answer could be C.

21. Is X bigger or smaller than Y?

(1)  $X > Z$ .

(2)  $Y > Z$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Use both statements. Pick  $Z = 2$ .

$X=3$ ,  $Y=4$  fulfill both statements and  $Y > X$ .

$X=4$ ,  $Y=3$  fulfill both statements and  $Y < X$ .

Therefore more sufficient data is required.

24. A long rope was divided to three different parts. What is the length of the smallest piece?

(1) The sum of the two smaller pieces is 14 inch.

(2) The sum of the two larger pieces is 22 inch.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Translate the statements into variables: Let X, Y and Z be the three pieces of the rope,  $X < Y < Z$ .

Statement (1) can be written as:  $X + Y = 14$ .

Statement (2) can be written as:  $Y + Z = 22$ .

In order to find the length of the smallest piece, we need another equation or data. More data is required.

25. A hose was divided into 3 smaller and different in size hoses. What is the difference between the length of the largest and the smallest hose?

(1) The sum of the two larger hoses is 45 feet.

(2) The sum of the two smaller hoses is 23.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Translate the statements into variables: Let X, Y and Z be the three pieces of the hose,  $X < Y < Z$ .

Statement (1) can be written as:  $Z + Y = 45$ .

Statement (2) can be written as:  $X + Y = 23$ .

In order to find the difference between Z and X, subtract the second statement from the first to get:

$Z - X = 22$ , and this is what we were looking for.

Both statements, taken together, are sufficient.

26. Fuel tanker A can fill the underground reservoir in 12 minutes. How long will it take fuel tanker A and fuel tanker B to fill up the same reservoir together?

(1) The reservoir contains 3000 liters of fuel.

(2) Fuel tanker A alone will require the same number of hours to fill the same reservoir.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is B.

Statement (1) is insufficient since the size of the reservoir is irrelevant. Statement (2) is sufficient since it tells us that the second tanker has the same output as the first one and so it will take them both half of the time it took the first tanker alone.

27. If  $Z$  is an integer, is  $Z/3$  an odd integer?

(1)  $Z/3$  is an integer.

(2)  $Z/6$  is an integer.

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is B.

Statement (1) is insufficient. If  $Z=6$ ,  $Z/3$  is even and if  $Z=9$ ,  $Z/3$  is odd. Statement (2) is sufficient. If  $Z/6 = X$  ( $X$  is an integer according to the statement) then  $Z/3 = 2X$ .

$2X$  must be an even integer since it's a multiplication of an integer by 2. Therefore  $Z/3$  is always even. Statement (2) is sufficient.

28. What is the ratio between A and B?

(1) A is the sum of X, Y and Z.

(2) B is the average (arithmetic mean) of X, Y and Z.

- a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.
- b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.
- c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.
- d) Either statement BY ITSELF is sufficient to answer the question.
- e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) tells us that  $A = X + Y + Z$ .

Statement (2) tells us that  $B = (X + Y + Z)/3$ .

Using both statements together: A/B is 3.  
Both statements together are sufficient.

29. If X and Y are both integers different from zero, what is the value of (X + Y)?

(1)  $X^3 = Y^3$ .

(2)  $Y = 10$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is C.

Statement (1) gives us the relations between X and Y, they must be equal because the power is odd.

Statement (2) gives us Y and by using the first statement, we know the value of X also.

Both statements, taken together, are sufficient.

30. If X and Y are both integers different from zero, what is the value of (X + 2Y)?

(1)  $X^4 = Y^4$ .

(2)  $X = 5$ .

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question.

The best answer is E.

Statement (1) tells us that X and Y are equal? No, they could have different signs.

Statement (2) gives us X, which is not sufficient.

Both statements together are also insufficient since Y can be -5 or 5.

More sufficient data is required.

5. M.A.S (Most Affordable Speed) is defined as the speed where the fuel consumption of a car is the lowest. The average family car consumes 3 liters of fuel per 36 kilometers at the M.A.S with only one passenger (the driver). A pickup truck consumes twice as much as a family car does.

Assuming the fuel consumption of both cars rises by  $3\frac{1}{3}\%$  of the original consumption for each additional passenger, how many km per liter would a pickup truck do if the driver has three additional passengers?

(a) 10 km.

(b) 5.8 km.

(c) 6 km.

(d) 5.4 km.

(e) 4 km.

The best answer is D.

This is a question with a lot of dispensable text, it teaches us to focus on relevant information only. A family car consumes 1 liter for 12 Km, a pickup truck consumes twice as much, 1 liter for 6 Km. There are 3 additional passengers so the consumption rises by 10%,

$6Km \times 0.9 = 5.4Km$ .

6. A Super-Jet airplane is flying at an average speed of 500 miles per hour. The average speed of a Turbo-Prop airplane is 15% lower than that of a Super-Jet. How long will it take a Turbo-Prop airplane to fly 950 miles?

- (a) 2 hours.
- (b) 1 hour and 30 minutes.
- (c) 3 hours and 15 minutes.
- (d) 2 hours and 24 minutes.
- (e) 4 hours.

The best answer is A.

The average speed of a Turbo-Prop airplane is 85% of that of a Super-Jet airplane, meaning 425 mph. (15 % is  $\frac{3}{20}$  fraction, so  $\frac{17}{20} * 500$  is 425).

Traveling at 425 mph, it would take the airplane 2 hours to travel 950 miles.

8. A windmill is taking advantage of strong air currents in order to produce electrical energy. On a typical day the wind speed is around 20 mph and in that speed the windmill produces 800 kw/h (kilowatts per hour). On a stormy day a windmill produces 20% more energy. How much kw/h can three windmills produce in two hours on a stormy day?

- (a) 2880.
- (b) 4860.
- (c) 5780.
- (d) 5760.
- (e) 6380.

The best answer is D.

On a stormy day, a windmill will produce 20% more energy. 20% of 800 is 160, so each windmill will give out 960 kw/h. Three windmills will give  $3 \times 960 = 2880$ , which is answer (a), but we want two hours so the answer is  $2880 \times 2 = 5760$ .

6. If  $0.22z = 118.8$ , then  $z =$

- (a) 540

- (b) 622
- (c) 830
- (d) 991
- (e) 1000

The best answer is A.

Because the answer choices are so far apart, you can ballpark this problem. Multiply both sides by 100 to eliminate the decimal points:

$$22z = 11880, \text{ divide both sides by } 22.$$

$$z = 540.$$

7. If  $0.45x = 101.25$ , then  $x =$

- (a) 180
- (b) 225
- (c) 328
- (d) 444
- (e) 448

The best answer is B.

Because the answer choices are so far apart, you can ballpark this problem. Multiply both sides by 100 to eliminate the decimal points:

$$45x = 10125, \text{ divide both sides by } 45.$$

$$x = 225.$$

8. If  $0.01z = 9.99$ , then  $z =$

- (a) 99.9
- (b) 999.9
- (c) 999
- (d) 9999.9
- (e) 9999

The best answer is C.

Because the answer choices are so far apart, you can ballpark this problem. Multiply both sides by 100 to eliminate the decimal points:

$$z = 999.$$

9. If  $0.06x = 52.2$ , then  $x =$

- (a) 540
- (b) 622
- (c) 830
- (d) 870
- (e) 920

The best answer is D

Because the answer choices are so far apart, you can ballpark this problem. Multiply both sides by 100 to eliminate the decimal points:

$$6x = 5220, \text{ divide both sides by } 6.$$

$$x = 870.$$

15. A taxi company costs \$2.75 for the first quarter-mile and 12.5 cents for each additional quarter mile. What is the maximum distance you can travel with \$6.50?

- (a) 4 miles
- (b)  $5 \frac{3}{4}$  miles
- (c)  $6 \frac{1}{2}$  miles
- (d)  $7 \frac{3}{4}$  miles
- (e)  $8 \frac{1}{4}$  miles

The best answer is D.

Since you spend \$2.75 for the first quarter mile, you have \$3.75 ( $6.5 - 2.75$ ) left to spend on  $\frac{1}{4}$  mile intervals. \$3.75 divided by \$.125 equals 30 quarter miles. The 30 miles, plus the initial quarter mile, makes a total of 31 quarter miles. 31 quarter-miles equal 7.75 miles.

16. A photo-mat shop charges \$0.55 for the first photo inside a film, and 40% cents less for each additional photo. How many photos can we develop with \$52.58 if each film contains 36 photos?

- a) 4 films and 12 photos
- b) 5 films and 6 photos
- c) 5 films and 14 photos
- d) 6 films and 4 photos
- e) 6 films and 28 photos

The best answer is A.

Each film costs:  $0.55 + 35 \times (60\% \text{ of } 0.55 \text{ \$ is } 0.33) = 0.55 + 11.55 = 12.1\text{\$}$  per film.

$52.58\text{\$} = 4 \times 12.1\text{\$} + 4.18\text{\$}$ .

$4.18\text{\$} - 0.55\text{\$} = 3.63\text{\$}$ .  $3.63\text{\$}/0.33\text{\$} = 11 \rightarrow$  All together gives 4 films + 12 photos.

17. In a fuel station the service costs \$1.75 per car, every liter of fuel costs 0.65\$. Assuming that a company owns 12 cars and that every fuel tank contains 55 liters and they are all empty, how much money total will it cost to fuel all cars?

- (a) 320\$
- (b) 380\$
- (c) 420\$
- (d) 450\$
- (e) 480\$

The best answer is D.

The cost of fuel per car is:  $1.75 + 0.65 \times 55 = 37.5 \text{ \$}$ .

There are 12 cars so the sum is  $37.5 \times 12 = 450 \text{ \$}$ .

18. In a fuel station the service costs \$1.15 per car, every liter of fuel costs 0.4\$. Assuming that you own 2 sports cars and 2 executive cars and all fuel tanks are empty. How much will it cost to fuel all cars together if a sports car tank is 32 liters and an executive car tank is 75% bigger?

- (a) 37.5\$
- (b) 75\$
- (c) 87.5\$
- (d) 94.5\$
- (e) 98.4\$

The best answer is B.

The cost of fuel per a sports car is:  $1.15 + 32 \times 0.4 = 13.95$  \$.

The cost of fuel per an executive car is:  $1.15 + (32 \times 1.75) \times 0.4 = 1.15 + 56 \times 0.4 = 23.55$  \$.

The sum of the fuel price is:  $13.95 \times 2 + 23.55 \times 2 = 75$ \$

19. In a fuel station the service costs \$2.05 per car, every liter of fuel costs 0.6\$. Assuming that you fill up 3 mini-vans and 2 trucks, how much money will the fuel cost to all the cars owners total, if a mini-van's tank is 65 liters and a truck's tank is 120% bigger and they are all empty-?

- (a) 122.6\$
- (b) 128.9\$
- (c) 243.7\$
- (d) 298.85\$
- (e) 312.12\$

The best answer is D.

The cost of fuel per mini-van is:  $2.05 + 65 \times 0.6 = 41.05$ \$.

The cost of fuel per an executive car is:  $2.05 + (65 \times 2.20) \times 0.6 = 2.05 + 143 \times 0.6 = 87.85$  \$.

The sum of the fuel price is:  $3 \times 41.05 + 2 \times 87.85 = 298.85$ \$

20. The average (arithmetic mean) of seven numbers is 12.2. If the sum of four of these numbers is 42.8, what is the average of the other 3 numbers?

- (a) 12.4
- (b) 14.2
- (c) 16.8
- (d) 18.6
- (e) 19.2

The best answer is B.

This is an average problem, so use the average formula. If the average of 7 numbers is 12.2, we can solve for their sum:  $7 \times 12.2 = 85.4$ . If four of these numbers total 42.8, then by subtracting 42.8 from 85.4, we get the sum of the other three numbers, 42.6. To find the average of these three numbers, we divide their sum by their number:  $42.6/3 = 14.2$ .

21. The average (arithmetic mean) of eight numbers is 44.1. If the sum of half of these numbers is 158.4, what is the average of the other half?

- (a) 12.8
- (b) 24.2
- (c) 48.6
- (d) 72.1
- (e) 96.8

The best answer is C.

This is an average problem, so use the average formula. If the average of 8 numbers is 44.1, we can solve for their sum:  $8 \times 44.1 = 352.8$ . If four of these numbers total 158.4, then by subtracting 158.4 from 352.8, we get the sum of the other four numbers, 194.4. To find the average of these 4 numbers, we divide their sum by their number:  $194.4/4 = 48.6$ .

22. Eric, Nick and Archi make contributions to the Society Of Nature Protection in the ratio of 5:3:2.5. If altogether they contribute 5145 Nis, how much more money does Nick contribute than Archi?

- (a) 128 Nis
- (b) 212 Nis
- (c) 234 Nis
- (d) 245 Nis
- (e) 288 Nis

The best answer is D.

Add the numbers in the ratio  $5:3:2.5 = 10.5$ . Divide the 5145 by 10.5 and you get the basic

Unit = 490 Nis. Nick contributes 0.5 more units than Archi, and since each unit is 490, he contributed 245 Nis more.

24. Of 70 players on a football team, 37 are throwers. The rest of the team is divided so one third are left-handed and the rest are right handed. Assuming that all throwers are right handed, how many right-handed players are there total?

- (a) 54
- (b) 59
- (c) 63

- (d) 71
- (e) 92

The best answer is B.

70 – 37 are the rest. Meaning that  $33/3 = 11$  are left-handed. The overall number of right handed:  $37 + 22 = 59$ .

23. Irin, Ingrid and Nell bake chocolate chip cookies in the ratio of 9.18: 5.17: 2.05. If altogether they baked a batch of 148 cookies, what percent of the cookies did Nell bake?

- (a) 0.125%
- (b) 1.25%
- (c) 12.5%
- (d) 125%
- (e) 0.152%

The best answer is C.

Add the numbers in the ratio to get  $9.18 + 5.17 + 2.05 = 16.4$ .

You don't need to relate to the number of cookies, it doesn't contribute anything.

The relative part of Nell is  $2.05/16.4 = 0.125 = 12.5\%$

26. On a map, 1 inch represents 28 miles. How many inches would be necessary to represent a distance of 383.6 miles?

- (a) 5.2
- (b) 7.4
- (c) 13.7
- (d) 21.2
- (e) 28.7

The best answer is C.

This is a proportion problem. Dividing the requested amount of miles by the reference amount would give us the answer in inches.  $383.6 / 28 = 13.7$  inches.

25. Of 15 players on a basketball team, one third are left handed. Out of the right-handed players there are 80% over 2 meters high. Assuming that out of the left handed players there are 40% players fewer than 2 meters. How many players are there over 2 meters in height?

- (a) 6
- (b) 7
- (c) 8
- (d) 9
- (e) 10

The best answer is E.

Start from the top. One third are left handed (5). Out of the right-handed players there are 8 players over 2 meters. 40% of 5 are 2 players. All together over 2 meters there are 10 players.

27. On a map, 1.5 inches represent 24 miles. How many miles approximately is the distance if you measured 47 centimeters assuming that 1-inch is 2.54 centimeters?

- (a) 174.2
- (b) 212
- (c) 288.1
- (d) 296
- (e) 282.4

The best answer is D.

Dividing the number of centimeters in 2.54 gives you the number of inches:  $47/2.54 = 18.5$  inches. 1.5 inches represent 24 miles, 1 inch represents 16 miles.

$(18.5 \text{ inches}) \times (16 \text{ miles}) = 296 \text{ miles}$ .

28. On a mechanical gear, 6 teeth represent a movement of 1.2 radians. The gear is connected to a wheel that moves twice as much. If the wheel moved 276 degrees how many teeth did the gear move assuming the each radian is approximately 60 degrees?

- (a) 11.5
- (b) 14.2
- (c) 28.3

- (d) 34.7
- (e) 41.3

The best answer is A

The wheel moved 276 degrees  $\rightarrow$  the gear moved 138 degrees / 60 = 2.3 radians.  
1.2 radians are 6 teeth  $\rightarrow$  one radian is 5 teeth's.  $2.3 \times 5 = 11.5$  teeth movement.

29. A rotometer is a device that measures flow of liquid and gases. When measuring liquid phase flows, 2.5 inches represent 60 liters per minute of liquid. With gas measurements the rotometer moves 50% of the movement he moves with the liquid phase. How many liters of gas passed through the rotometer if it measured 4 inches?

- (a) 176
- (b) 192
- (c) 202
- (d) 218
- (e) 284

The best answer is B

The rotometer moves 50% of 2.5 meaning 1.25 inches is 60 liters of gas. The rotometer moved 4 inches.  $4/1.25 = 3.2 \times 60$  liters is 192 liters measured.

30. Billy worked for three straight hours on his homework questions. If he solved 132 questions in the third hour, which was twice as many as he solved in the second hour, and three times as many questions as he solved in the first hour, how many questions did he solve total?

- (a) 242
- (b) 312
- (c) 424
- (d) 525
- (e) 622

The best answer is A.

$132 / 2$  are 66 questions in the second hour,  $132 / 3$  are 44 questions in the third hour.

$132 + 66 + 44 = 242$  questions.

31.  $V$  is the volume of a cylinder; the radius of the cylinder is 3.4. The height of the cylinder is 550% more than the radius. Which of the following is true?

- (a)  $100 < V < 300$
- (b)  $300 < V < 500$
- (c)  $500 < V < 700$
- (d)  $700 < V < 900$
- (e)  $900 < V < 1100$

The best answer is D.

You can start with the length. Length =  $6.5 \times 3.4$  is approximately 22.

The Volume of the cylinder is the area of its face  $\times$  its length.

Area of face =  $\pi \cdot R^2 = \pi \cdot (3.4)^2 \cong 36$ .

$V$  is approximately  $36 \times 22 = 792$  and the best answer is D.

1. Two trains are traveling on a collision course. If train A is traveling at a speed of 350 mph and train B is traveling 28% slower, how much time will it take the trains to collide if the initial distance between the two is 1505 miles?

- (a) Two hours and 30 minutes.
- (b) One hour and 10 minutes.
- (c) Two hours and 25 minutes.
- (d) Three hours and 15 minutes.
- (e) Four hours and 20 minutes.

The best answer is A.

Train B is traveling at a speed of  $0.72 \times 350 = 252$  mph.

The two trains are traveling in opposite directions. Thus, the distance should be divided by the sum of their speeds =  $252 + 350 = 602$  mph.

$1505 \text{ miles} / 602 = 2.5 =$  two hours and 30 minutes.

2. Two cars are traveling towards each other. If car A is traveling at a speed of 50 mph and car B is traveling 12% slower, how much time will

it take the cars to meet if the initial distance between the two is 705 miles?

- (a) Six hours and 30 minutes.
- (b) Seven hours and 30 minutes.
- (c) Eight hours and 20 minutes.
- (d) Nine hours and 15 minutes.
- (e) Ten hours and 20 minutes.

The best answer is B.

Car B is traveling at a speed of  $0.82 \times 50 = 44$  mph.

The cars are traveling in opposite directions. Thus, the distance should be divided by the sum of their speeds =  $50 + 44 = 94$  mph.

$705 \text{ miles} / 94 = 7.5 =$  seven hours and 30 minutes.

4. Tom and Jerry are running on the same road towards each other. If Tom is running at a speed of 2.5 meters per second and Jerry is running 36% slower, how much time will it take them to meet if the initial distance between the two is 50 meters and Tom started running 20 seconds before Jerry did?

- (a) 2 minute and 12 seconds.
- (b) two minutes.
- (c) 44 seconds.
- (d) 20 seconds.
- (e) 12 seconds.

The best answer is D.

Jerry is running at a speed of  $0.64 \times 2.5 = 1.6$  meters per second.

Tom runs alone a distance of  $2.5 \times 20 = 50$  meters. Tom caught Jerry off-guard and Jerry didn't even start running.

7. Rain is falling at a rate of 3 centimeters per hour all over Springfield. Somewhere downtown in Springfield a group of pigeons is waiting for the rain to stop. If the rain filled a round puddle the with a base area of 350 square centimeters and a depth of 13.5 centimeters, how long did the pigeons wait for the rain to stop?

- (a) 3 hours and 12 minutes.
- (b) four hours and 30 minutes.

- (c) four hours and 45 minutes.
- (d) five hours and 10 minutes.
- (e) five hours and 30 minutes.

The best answer is B.

The volume of the puddle is irrelevant since rain fell all over the city. Thus, you should relate to the depth that fell only.  $13.5 / 3 = 4.5$  hours of rain.

16. Ronald is now 4.5 years older than Andrew and third of that amount older than Ingrid. If in 0.5 years, Ronald will be three times older than Andrew, then in 2.25 years what would be Ingrid's divided by Andrew's age multiplied by Ronald's age?

- (a) 8.125
- (b) 12.5
- (c) 12.875
- (d) 14.875
- (e) 15.225

The best answer is D.

Translate piece by piece into numbers.  $R$  (Ronald) =  $A$  (Andrew) + 4.5.

The second equation:  $R = I$  (Ingrid) + 1.5.

The third equation:  $R + 0.5 = 3(A + 0.5)$ . We have three equations with three variables.

→ Ronald is 6.25, Ingrid is 4.75 and Andrew is 1.75. In 2.25 years, Ronald will be 8.5, Ingrid will be 7 and Andrew will be 4. The answer is:  $7 / 4 \times 8.5 = 14.875$ .

17. Richard is now 14.5 years older than Arthur and half of that amount older than Sam. If in 2.75 years, Richard will be twice and a half older than Arthur, then in 7 years what would be Arthur's age approximately?

- (a) 8
- (b) 14
- (c) 22
- (d) 24
- (e) 30

The best answer is B .

Translate piece by piece into numbers.  $R$  (Richard) =  $A$  (Arthur) + 14.5.

The second equation:  $R = S$  (Sam) + 7.25.

The third equation:  $R + 2.75 = 2.5(A + 2.75)$ . We have three equations with three variables.

→ Today Arthur's age is approximately 6.9 (take 7). In 7 years he would be about 14 years old.

18. In 13.5 years Stacy will be as old as Carolyn is now. Thirty two years ago Carolyn was two and a half the age of Stacy. How old will Stacy be a decade from now?

- (a) 36
- (b) 47
- (c) 51
- (d) 64
- (e) 71

The best answer is C.

Translate the data into numbers:  $s$  (Stacey) + 13.5 =  $c$  (Carolyn) and

$2.5(s-32) = c - 32$ .

From the equations → Today Stacy is 41 years old, in a decade from now she will be 51.

19.  $X$  years in the future, Zach will be  $Y$  years old.  $Z$  years in the future, Zach will be how old?

- (a)  $Z + X + Y$
- (b)  $Z + X - Y$
- (c)  $X - Y - Z$
- (d)  $Y - X + Z$
- (e)  $2Z + X - y$

The best answer is D.

Write the following equations: Zach +  $X$  =  $Y$  and Zach +  $Z$  = ?

Put Zach from the first equation and place it in the second one:  $Y - X + Z$  is the age in  $Z$  years.

21. An investment yields an interest payment of \$68 each week. If the annual interest rate is 7.5%, what is the amount of the investment?

- (a) \$28,600
- (b) \$30,430
- (c) \$34,330
- (d) \$37,860
- (e) \$43,520

The best answer is D.

Principal  $\times$  percent interest = interest earned

$$\text{Principle} \times (0.075) \times 1/(12 \times 4) = \$68.$$

$$\text{Solve for the principal } (68 \times 12 \times 4)/.075 = \$43,520.$$

22. An investment yielded an interest payment of \$350 each month when the annual interest rate was 9%, what is the amount of the investment that should be invested with an annual interest rate of 8% if We want to gain 15% more each month?

- (a) \$60,375
- (b) \$50,400
- (c) \$41,300
- (d) \$32,500
- (e) \$25,100

The best answer is A.

The new monthly payment should be  $1.15 \times \$350 = \$402.5$ . Now we'll proceed with the formula:

Principal  $\times$  percent interest = interest earned

$$\text{Principle} \times (0.08) \times 1/12 = \$402.5.$$

$$\text{Solve for the principal } (402.5 \times 12)/.08 = \$60,375.$$

23. An investment gained an interest payment of \$250 each month when the annual interest rate was 8%, how much more should we invest annually if we want to gain 12% more per month with a new annual interest rate of 7.5% ?

- (a) \$9,360
- (b) \$9,100
- (c) \$8,250
- (d) \$7,300
- (e) \$7,150

The best answer is D.

The new monthly payment should be  $1.12 \times \$250 = \$280$ . Now we'll proceed with the formula:

Principal  $\times$  percent interest = interest earned

Solve for the principal for the 9% interest:  $(250 \times 12) / .09 = \$37,500$ , this is what we invested before.

Solve for the principal for the 6.5% interest:  $(280 \times 12) / .065 = \$44,800$ , this is what we should invest with the new interest.  $(44800 - 37500 = \$7,300)$  is the amount to be added to the prime payment.

24. Mike earns \$14 per hour and Phil earns \$10.5 per hour. Approximately how much less, as a percentage, does Phil earn than Mike per hour?

- (a) 25%
- (b) 32.5%
- (c) 37%
- (d) 37.5%
- (e) 40%

The best answer is A.

Mike earns  $(14 - 10.5) = \$3.5$  more than Phil, that is  $3.5 / 14 = 0.25 = 25\%$ .

25. The original price of a car was \$25,200. Because the car owner thought he could get more money for the car, he increased the price of the car to 110% of its original price. After a week, the car had not sold, so the owner then discounted the price by 10%, and the car was finally sold. What price was the car sold for?

- (a) \$25,200
- (b) \$25,000

- (c) \$24,948
- (d) \$24,542
- (e) \$23,658

The best answer is C.

Pay attention, when you raise a number by  $X\%$  and then you reduce  $X\%$  you don't get the original number again because the second time you took  $X\%$  off you reduced it from a larger number thus answer A is not the correct one, let's check:

$$25,200 \times 1.1 = 27,720.$$

$$27,720 \times 0.9 = 24,948 \text{ and not } 25,200. \text{ The correct answer is C.}$$

26. A frustrated greengrocer is trying to sell cucumbers at a price of \$1.5 per Kg. Unfortunately he has no success. The greengrocer gives a discount of 18% on the original price but then the cucumbers are sold too fast so he raises the price again by 10%. At that final price, how many cucumbers can you buy for \$4.5 assuming that there are 12 cucumbers per Kg and that only a whole number of Kgs are sold?

- (a) 25
- (b) 34
- (c) 40
- (d) 46
- (e) 48

The best answer is E.

$$1.5 \times 0.82 = \$1.23.$$

$$\$1.23 \times 1.1 = 1.353\$$$

$$5 / 1.353 = 4 \text{ Kg and change} = 48 \text{ cucumbers.}$$

27. An air-conditioning unit costs \$470. On December there was a discount for Christmas of 16%. Six months later, the holiday season was over so the company raised the price of the air-conditioning by 16%. How much will an air-conditioning unit cost in November?

- (a) \$458
- (b) \$470
- (c) \$472
- (d) \$484
- (e) \$491

The best answer is A.

Pay attention, when you raise a number by  $X\%$  and then you reduce  $X\%$  you don't get the original number again because the second time you took  $X\%$  off you reduced it from a larger number thus answer A is not the correct one, let's check:

$$470 \times 0.84 = 394.8.$$

$$394.8 \times 1.16 = \text{approximately } \$458.$$

A simpler way to solve this problem is by knowing that the price would be lower than the original price because we increased and decreased the same amount of percentage.

28. In a rectangular coordinate system, what is the area of a triangle whose vertices have the coordinates (4, 0), (6, 3), and (6, -3)?

- (a) 7.5
- (b) 7
- (c) 6.5
- (d) 6
- (e) 5.5

The best answer is D.

First draw the x and y-axes, then plot the points and connect them. The length of the base is 6 units [from (6, 3) to (6, -3)] and the height is 2 units [from (6, 0) to (4, 0)].

$$\text{Area of a triangle} = (\text{base} \times \text{height}) / 2, \text{ so } (6 \times 2) / 2 \text{ is } 6.$$

30. In a rectangular coordinate system, what is the area of a rectangle whose vertices have the coordinates (-4, 1), (1, 1), (1, -3) and (-4, -3)?

- (a) 16
- (b) 20
- (c) 24
- (d) 25
- (e) 30

The best answer is B.

First draw the x and y axes, then plot the points and connect them, right away you can see that the base is 5 units and the height is 4 units. The area of the rectangle is 20.

31. In a rectangular coordinate system, what is the area of a rhombus whose vertices have the coordinates (0, 3.5), (8, 0), (0, -3.5), (-8, 0)?

- (a) 56
- (b) 88
- (c) 112
- (d) 116
- (e) 120

The best answer is A.

First draw the x and y axes, then plot the points and connect them.

The area of a rhombus is simply the product of its diagonals divided by 2.

The area is  $= 16 \times 7 = 112/2=56$ .

32. In a rectangular coordinate system, what is the square root of the area of a trapezoid whose vertices have the coordinates (2, -2), (2, 3), (20, 2), (20, -2)?

- (a) 7.5
- (b) 9
- (c) 10.22
- (d) 12.25
- (e) 14

The best answer is B.

First draw the x and y axes, then plot the points and connect them.

The area of a trapezoid is  $(\text{base}_1 + \text{base}_2) \times (\text{height}) / 2$ .

Base<sub>1</sub> = 5, base<sub>2</sub> = 4, height = 18 thus the area is  $9 \times 9 = 81$ .

The answer to the question is the square root of 81, meaning 9.

33. How much interest will \$2,400 earn at an annual rate of 8% in one year if the interest is compounded every 4 months?

- (a) \$141
- (b) \$150
- (c) \$197
- (d) \$234
- (e) \$312

The best answer is C.

Here, it is enough to calculate the simple interest of 8% per year.  
 $\$2,400 \times 8/100 \times 1 = \$192$ . since we are calculating as a compounded rate, the interest should be a bit higher, or C as the best answer.

34. A GMAT class has a ratio of girls to boys of 1.5 to 3. If the class has a total of 36 students, how many more girls are there than boys?

- (a) 8
- (b) 10
- (c) 12
- (d) 15
- (e) 18

The best answer is C.

This is a standard ratio problem.  $36 / (1.5 + 3) = 8$ .

The number of boys is  $8 \times 3 = 24$ .

The number of girls is  $8 \times 1.5 = 12$ .

The difference between the numbers is 12.

34. A Math-club class has a ratio of girls to boys of 1.5 to 4.5. Out of all the boys 16.66% are left-handed, how many left-handed boys are there in the class assuming that there are 24 students all together.

- (a) 8
- (b) 6
- (c) 5
- (d) 4
- (e) 3

The best answer is E

This is a standard ratio problem.  $24 / (1.5 + 4.5) = 4$ .

The number of boys is  $4 \times 4.5 = 18$ .

The number of girls is  $4 \times 1.5 = 6$ .

16.66% out of 18 are 3 boys.

1. Is  $a > b$ ?

(1)  $a^2 > b^2$

(2)  $a+d > b+d$

Explanation:

**The best answer is: B.**

**Plug in numbers. The first statement will work when  $a=3$  and  $b=2$ , for example and then  $a^2=9$  and  $b^2=4$ . However, it will not work when  $a=(-2)$  and  $b=(-3)$ , then  $a^2=4$ , and  $b^2=9$ .**

**The second statement is sufficient, it is possible to subtract  $d$  from both sides of the inequality and get:  $a+d-d > b+d-d$ , or  $a > b$ .**

2. At a certain library, there are fiction and non-fiction books only. How many of the books are non-fiction books?

(1) There are 13,200 books at the library.

(2) 35% of the books at the library are non-fiction books.

Explanation:

**The best answer is: C.**

**The first statement alone does not give the information needed to know how many of the 13,200 books are fiction and how many are non-fiction. The second statement does not tell us 35% of what number are non-fiction books. The two statements together, give us enough information to calculate 35% of 13,200 and find the number of non-fiction books.**

3. Is the integer  $X$  even?

(1)  $X$  is divisible by 7.

(2) X is divisible by 11.

Explanation:

**The best answer is: E.**

**The fact that X is divisible by 7 does not help figure out whether it is odd or even, both even and odd numbers could be divisible by 7. The same applies for 11; both even and odd numbers could be divisible by 11. Both statements taken together do not shed a new light on the matter, there could be even and odd numbers that are divisible by 7 and 11.**

4. Is  $(a+b)^2 + (a+b)^3$  even?

(1) a and b are positive.

(2)  $a > b$ .

Explanation:

**The best answer is: D.**

**Each statement alone is sufficient since there are only three possibilities:**

**(1) a and b are even.**

**(2) a and b are both odd.**

**(3) One is odd and the other is even.**

**Any of the options give us an even result, thus, the expression is always even.**

5. Is the product  $xy$  divisible by 22?

(1)  $x$  is divisible by 4.

(2)  $y$  is divisible by 11.

Explanation:

**The best answer is: C.**

**The prime factors of 22 are 2 and 11. Hence, if  $x$  is divisible by 4, it is divisible by 2 and if  $y$  is divisible by 11, surely  $xy$  is divisible by 22.**

6. If A, B and C are integers. Is AB a factor of C?

(1) A is a factor of B.

(2) B is a factor of C.

Explanation:

**The best answer is: E.**

**Plug in numbers: A=4, B=8, C=16. A is a factor of B and B is a factor of C, However, AB=32 is not a factor of C=16.**

7. What is the value of (a+b)?

(1)  $a^2 - b^2 = 133$ .

(2)  $a - b = 7$ .

Explanation:

**The best answer is: C.**

**Since  $a^2 - b^2 = (a+b)(a-b)$ ,  $133 = (a+b)7$ , and  $(a+b) = 19$ . Both statements are needed to solve the question.**

8. What is the value of  $x+z$ ?

(1)  $x+y=11$

(2)  $z+y=13$

Explanation:

**The best answer is: E.**

**Each statement alone leaves out one of the terms x or z, so we cannot find their sum using any statement alone. Moreover, even combining both statements does not help:**

$$x + y = 11 \quad z + y = 13$$

$$y = 11 - x \quad y = 13 - z$$

$$11 - x = 13 - z$$

$$z - x = 13 - 11$$

**It is only possible to find  $z-x$ .**

9. What was the total amount John earned on his two investments?

(1) John received an annual interest of 5% on one investment and 13% on the other.

(2) John invested a total of \$15,000 on both investments.

Explanation:

**The best answer is: E.**

**Knowing the interest alone is not enough to calculate the profit.**

**Knowing the total amount invested is not enough to calculate the profit, unless we have the interest rate.**

**Since we have no knowledge of the amount invested in each investment, there is no way to know how much was earned.**

10. What percent of the employees In X Company are managerial employees?

(1) 30% of the employees are technical.

(2) There are exactly 45 clerical employees in the X Company.

Explanation:

**The best answer is: E.**

**The fact that 30% are technical or that 45 are clerical, does not tell anything about the rest of the workers. In this question, 3 types of workers appear, technical, clerical and managerial. However, there is no mention of whether other types of workers exist also. Since we cannot assume there are no other types, we cannot answer the question.**

11. What is the average of a sequence of integers?

(1) There are 15 integers in the sequence.

(2) The sum of the integers in the sequence is 1275.

Explanation:

**The best answer is: C.**

**An average of a set of integers is calculated as the sum of the integers divided by the number of integers in the sequence. Statement 1, gives the number of integers, which is not enough by itself. Statement 2, gives the sum of the integers in the sequence, which is not enough by itself. Using the data from both statements is enough to find the average.**

12. What is the sum of the two smallest integers in a set of different positive integers?

- (1) There are 4 integers in the set.
- (2) The average of the integers in the set is 3.

Explanation:

**The best answer is: C.**

**The only two possible sets that have 4 different positive integers and an average of 3 are: [1, 2, 3, 6] and [1, 2, 4, 5]. The sum of the two smallest integers in both sets is always 3.**

13. If cookies are put in a jar and the jars of cookies are packed in a carton box, how many cookies does one carton box contain?

- (1) Every carton box is filled to half its volume.
- (2) Twenty cookies are put in each jar, and 12 jars are put in each carton box.

Explanation:

**The best answer is: B.**

**The first statement gives no information of the number of cookies. The volume of the carton box or the percent of its volume filled, do not help in finding any number. The second statement gives all the information needed in order to find the number of cookies packed in each carton box. The number of cookies per jar, and the number of jars per box are sufficient to calculate real numbers.**

14. The total volume of a swimming pool, when filled to capacity, is 2,652 gallons. How long will it take for the pool to fill up?

- (1) Water is being purred into the empty pool at the rate of 120 gallons per minute.
- (2) It takes 5 hours to empty the pool when it is half full.

Explanation:

**The best answer is: A.**

It is sufficient to know the rate of water being pumped and that the pool was empty to calculate the time needed for the pool to fill up:

$$\frac{2,652}{120} = 22.1\text{min.}$$

Therefore, statement 1 is sufficient. Statement 2 does not give information regarding the rate of filling the pool, thus, it is not sufficient.

1.  $X$  is an even number, which of the following is odd?

- (a)  $X^2$ .
- (b)  $(X+1)^2$
- (c)  $(X+2)^2$
- (d)  $X^3 + X$
- (e)  $2X^2$

The best answer is B.

The easiest way is to try out a number, lets say  $X=2$ .

You can see that B is 9, and that is always an odd number.

2.  $X$  is an integer, which of the following must be even?

- (a)  $X(X+2)+2$
- (b)  $X(X+1)+1$
- (c)  $X(X+1)$
- (d)  $X^2$
- (e)  $X^3+1$

The best answer is C.

You don't know whether or not  $X$  is even. In answer C you have a multiplication of two consecutive numbers so one of them must be even and an even number multiplied by an odd number is always even.

3.  $x$ ,  $y$ ,  $z$ , and  $w$  are integers. The expression  $x-y-z$  is even and the

Expression  $y-z-w$  is odd. If  $x$  is even what must be true?

- (a)  $y-z$  must be odd.
- (b)  $w$  must be even.
- (c)  $w$  must be odd.
- (d)  $z$  must be even.
- (e)  $Z$  must be odd

The best answer is C.

The first expression is even and the second is odd, the differences between the two expressions is  $x$  instead of  $w$ . (remember, there is no difference in odd/even numbers if the number is positive or negative so  $y-z$  is like  $z-y$ ). Therefore if  $x$  is even  $w$  must be odd.

X is an even number and Y is a positive odd number. Which of the following expressions mustn't be even?

- (a)  $(XY)^Y$
- (b)  $X^3Y^3$
- (c)  $X^3$
- (d)  $XY$
- (e)  $Y^2$

The best answer is E.

The fastest way to solve this problem is by trying out some numbers.

Lets say:  $X = 2$ ,  $Y = 1$ .

According to answer e:  $1 \times 1 = 1$  and that must be an odd number.

X is a prime number bigger than 10. Also,  $Y = X + X^3 + X^5 + X^7$ .  
What is definitely true about Y?

- (a) Y is a prime number.
- (b) Y is odd.
- (c) Y is even.
- (d) Y can be equally divided by 3.
- (e) Y can be equally divided by 7.

The best answer is C.

Because X is a prime number bigger than 10, he must be odd. Ignoring the powers of X in the expression of Y, you'll see that Y is a sum of 4 odd numbers therefore it must be even.

P is divisible by 4. Q is divisible by 3. Which of the following is definitely odd?

- $Q(P+1)$
- $2P+3Q$

$$PQ^2$$
$$P^2Q^3$$

None of the above.

The best answer is E.

P must be even but Q is either even or odd (3,6,...). None of the following answers are definitely odd although some can be.

A and B are integers. If  $2A - B = B - A$ , then which of the following is true?

$$B < A$$

$$A < B$$

A and B are even.

A is even and B is either even or odd.

B is even.

The best answer is D.

$2A - B = B - A \rightarrow 3A = 2B$ . Therefore 3A must be an even number and since 3 is odd, A must be even and B can be either even or odd.

8. A is even and B is odd. Which of the following expressions can't be an integer?

(a)  $\frac{A+1}{B+1}$

(b)  $\frac{A+1}{B}$

(c)  $\frac{B-1}{A}$

(d)  $\frac{A}{64}$

(e)  $\frac{A^4}{A \cdot B}$

The best answer is A.

In this question we are looking for an expression: odd/even, which can't be an integer. In answer A: The numerator is odd and the denominator is even therefore it can't be an integer.

1. If  $X$  is a positive integer, does  $X$  have six distinct positive factors?

(1)  $X$  is the product of four different positive primes.

(2)  $X = 18$ .

The best answer is D.

You can find out how many factors a number has if you know what that number is, or something about its prime factorization. Look for this as you move on to the statements.

Statement (1) is sufficient. If  $X$  is the product of four different prime numbers it will have six different factors; 1, the four prime numbers, and itself.

Statement (2) is also sufficient. 18 has 6 different factors: 1, 2, 3, 6, 9 and 18.

2. If  $Y$  is a positive integer, does  $Y$  have four distinct positive factors?

(1)  $Y = 8$ .

(2)  $Y$  is a multiplication of two different odd numbers.

The best answer is A.

Statement (1) is sufficient since 8 has the following factors: 1, 2, 4 and 8.

Statement (2) is not sufficient. For example, take 1 and 3, the product is 3, which has only two factors. But if you take 3 and 5, the product is 15 and we have 1,3,5 and 15 as factors of  $y$ , and we have four factors.

2. What is the value of  $(X + Y)$ ?

(1)  $3X + 8 = 14 - 3Y$ .

(2)  $(X + Y)^2 = 4$ .

The best answer is A.

From statement (1) we can find that  $3X + 3Y = 6 \rightarrow (X + Y) = 2$ . (1) is sufficient.

Statement (2) is insufficient,  $(X + Y)$  can be 2 or -2.

What is the value of  $(X^2 + Y^2)$ ?

(1)  $4X^2 - 7 = 17 - 4Y^2$ .

(2)  $(X + Y)^2 = 6 + 2XY$ .

The best answer is D.

Statement (1) can be written as  $4X^2 + 4Y^2 = 24 \rightarrow X^2 + Y^2 = 6$ . (1) is sufficient.

Statement (2) can be simplified:  $X^2 + 2XY + Y^2 = 6 + 2XY \rightarrow X^2 + Y^2 = 6$ . This statement is also sufficient.

If  $X$  and  $Y$  are integers and  $X + Y < 0$ , can  $X$  be greater than  $Y$ ?

(1)  $X < -2$ .

(2)  $Y > -4$ .

The best answer is D.

From each of the statements by itself we cannot determine if  $X$  can be greater than  $Y$ . Using both statements, we know the values each of the variables can get:

$X$ : -3, -4, -5, ...

$Y$ : -3, -2, -1, ...

We can see that  $X$ , at the most, can be equal to  $Y$  but it cannot be greater.

Both statements, taken together, are sufficient.

If  $X + Y = 17$ , is  $X < 0$ ?

(1)  $X < 17$ .

(2)  $Y < 17$ .

The best answer is B.

Statement (1) is insufficient.  $X$  can be 16 and then  $Y = 1$  or  $X$  could be -2 and then  $Y$  would be 19.

Statement (2) is sufficient, if  $Y$  is smaller than 17 then  $X$  must be negative in order to balance the expression back to 17.

$X$ ,  $Y$  and  $Z$  are three positive prime integers. What is the value of  $Y$ ?

(1) The product  $XYZ$  is divisible by 4.

(2)  $X$  is an odd number.

The best answer is C.

The question alone provides little information. Notice that it does not say that X, Y and Z are different.

Statement (1) tells us that XYZ is divisible by 4 and therefore two of the prime numbers are 2, meaning that only one of the prime numbers are odd.

Statement (2) completes statement (1) by adding that X is odd and therefore Y and Z must be equal to 2. Both statements, taken together, are sufficient.

If  $X^3 = Y$ , is Y a fraction?

(1)  $X^2$  is a fraction.

(2)  $X > Y$ .

The best answer is D.

Statement (1) is sufficient. If  $X^2$  is a fraction, X must also be a fraction. Meaning that  $X^3$  and Y will also be fractions.

Statement (2) is sufficient. If  $X^3$  is a fraction then X must be greater than  $X^3$ , which is also equal to Y. We get that from  $X > Y$ , so  $X^3$  and Y are fractions.

Is  $12x + 2 = 10 + 3x$ ?

(1)  $5x$  is smaller than or equal to 12

(2)  $2x$  is greater than or equal to 4

The best answer is B.

We can simplify the given question 'is  $9x = 8$ ?' or 'is  $x = 8/9$ '?

Statement (1) tells you that  $5x$  is smaller than or equal to 12,  $5x < 12$ , which essentially means,  $x < 12/5$ . If  $x < 12/5$ , it is unknown whether x does or does not equal  $8/9$ . In other words, statement (1) may or may not be sufficient.

Statement (2) tells you that  $2x$  is greater than or equal to 4. This means that x could never be less than two, therefore could never be equal to  $8/9$  and this statement is sufficient.

Is  $22Y = 10 + 7Y$ ?

(1)  $-5Y$  is greater than or equal to  $-10$ .

(2)  $-6Y$  is smaller than or equal to  $-6$ .

The best answer is B.

We can simplify the given question 'is  $15Y = 10$ ?' or 'is  $Y = 2/3$ '?

Statement (1) tells you that  $-5Y$  is greater than or equal to  $-10$ ,  $-5Y > -10$ , which essentially means,

$Y < 2$ . If  $Y < 2$ , it is unknown whether  $Y$  does or does not equal to  $2/3$ .

Statement (1) is insufficient.

Statement 2 tells you that  $-6Y$  is smaller than or equal to  $-6$  or that  $Y > 1$ .

This means that  $Y$  could never be less than one, therefore could never be equal to  $2/3$ . This statement is sufficient.

What is the value of  $(A + 3B/7)$ ?

(1)  $5600A + 2400B = 12,000$ .

(2)  $50B - 50 + 250A = 9700 - 4200A - 1900B$ .

The best answer is D.

Simplify the (1) statement by dividing both sides by 5600:  $A + 3B/7 = 15/7$ . This statement is sufficient.

Simplify the (2) statement by adding similar items to get:  $4550A + 1950B = 9750$ . Divide both sides by 4550 to get:  $A + 3B/7 = 15/7$  this statement is also sufficient.

What is the value of  $(X + 2Y/5)$ ?

(1)  $292X - 675 + 80Y = 100 - 18X - 44Y$ .

(2)  $300X + 80Y - 830 = 82.5 - 85X - 66Y$ .

The best answer is A.

Simplify statement (1). Add similar items,  $310X + 124Y = 775 \rightarrow X + 2Y/5 = 2.5$ . This statement is sufficient.

Do the same to statement (2) and you'll see that  $385X + 146Y = 912.5$ , when divided by 385:  $X + 146Y/385 = 2.5$ . This statement is insufficient.

What is the par value of the stock Y?

(1) The purchase price of stock Y was 120 Australian dollars.

(2) Stock Y increases in value by 8.5% each year.

The best answer is E.

We are asked to specify the exact value of Y today.

Statement (1) is insufficient since it gives us the purchase value of the stock. However, no purchase date is provided.

Statement (2) is also insufficient since it doesn't specify how many years have passed since the stock was bought. Both statements together are also insufficient since they don't mention the time that has passed since the stock was bought.

A turtle is crossing a field, how many meters total did he pass?

(1) The average speed of the turtle is 2 meters per minute.

(2) Had the turtle walked 1 meter per minute faster than his average speed it would have finished the same path 40 minutes earlier.

The best answer is C.

Statement (1) gives us the average speed of the turtle; this statement is insufficient since the time is not given.

Statement (2) is also insufficient by itself since we don't know what the average speed is.

Both statements combined are sufficient since we can calculate the distance

$2 * T = D$  and  $3(T - 40) = D$ , solve to get  $D = 240$  meters.

What is the distance that Cynthia has to travel in order to get from the university to the dorms?

(1) Cynthia can walk half the distance in 7 minutes when walking at her fastest possible rate.

(2) Cynthia is walking at an average speed of 1 mile in 12 minutes.

The best answer is E.

Statement (1) is insufficient since it only gives the time period of reaching the half point at the maximum speed.

Statement (2) is also insufficient by itself since we are only told the average speed.

Both statements, taken together, are insufficient since the average speed, mentioned in (2) might be different than Cynthia's fastest possible rate.

The net value of a certain stock increased at a constant rate during the ten-year period between 1990 and 2000. What was the value of the stock in the year 1998?

(1) In 1991, the value of the stock was 130 U.S dollars.

(2) In 1992, the value of the stock was 149.5 U.S dollars.

The best answer is C.

We are told that the stock increases its value by a constant rate and therefore we need to find some kind of pattern in order to know the value every year.

Statements (1) and (2) taken together are sufficient since they give us the percent increase of the stock from 1991 to 1992, which is 15%. The value of the stock in 1998 can be easily calculated, add 15% every year until 1998.

A spaceship in orbit rotates around the planet Pluto. How many full rotations can the spaceship complete in 20 hours.

- (1) The radius of the rotation is 21,000 miles.
- (2) The spaceship travels at 35 miles per second.

The best answer is C.

In order to calculate the time it would take to complete one rotation, you need the radius and the velocity. Statement (1) provides the radius of rotation and (2) provides the velocity.

The distance the spaceship has to travel in order to complete one rotation is  $2 \cdot \pi \cdot R = 2 \cdot \pi \cdot (21,000)$  and the speed is 35 miles per second. Divide the first by the second and you'll get the time it would take the spaceship to complete one rotation.

What is the total number of students that will finish their first degree this year at the Willhunt University?

- (1) The number of male students that will finish their first degree ten less than three-fifths of number of female students.
- (2) The number of male students is 360.

The best answer is C.

Let  $m$  = males and  $f$  = females.

From Statement (1) you know that  $m = 3/5f - 10$ , but you don't know the actual values of  $m$  and  $f$ . From Statement (2) you know  $m$ , which can be fed into the equation derived from statement (1).

These two equations with two variables are sufficient and therefore both statements, taken together, are sufficient.

Is  $X > Y$ ?

(1)  $12X = 4C$ .

(2)  $C = 3Y^4$ .

The best answer is E.

Since we need to compare between X and Y, look at both statements together.

(1) and (2) state that:  $12X = 4C = 12Y^4 \rightarrow X = Y^4$ .

Take  $Y=-1, X=1$ : X is bigger than Y.

Take  $X=1$  and  $Y=1$ : X is not bigger than Y.

We can see that the answer is not distinct and therefore more data is required in order to solve the question.

If X is a prime number, is Y even.

(1)  $X = Y + 1$ .

(2)  $X = 5$ .

The best answer is C.

Statement (1) is insufficient by itself since X can be even (2) or odd (3).

Statement (2) is insufficient since we don't know the relation between X and Y.

Both statements together are sufficient since we know that X is odd and that Y is an odd number plus one, meaning an even number.

Is  $Y/X$  odd?

- (1)  $Y$  is a prime number.
- (2)  $X$  is a prime number.

The best answer is E.

Each statement alone is insufficient since it tells us nothing of the other variable.

(1) and (2) together are trick. If you take  $X=Y=5$  or any other prime number the result of  $Y/X$  will be odd but if you take  $X=5$  and  $Y=7$  for instance the result wouldn't even be an integer.

The answer cannot be determined and more data is required.

If  $A$  and  $B$  are two different integers, is  $A/B$  even?

- (1)  $A$  is prime.
- (2)  $B$  is prime.

The best answer is C.

Each statement alone is insufficient since each statement refers to one variable only.

(1) and (2) together are sufficient since dividing any two different primes will never result in an integer. A prime is a number that has exactly two natural divisors, 1, and itself and is therefore not divisible by any other integer.

How many mini sports cars does little Timmy own?

(1) Timmy has 10 red sports cars.

(2) The number of blue sports cars is 50% larger than the number of red sports cars.

The best answer is E.

Statement (1) gives us the number of red cars and (2) the number of blue cars. We are not told that there are only two colors of sports cars and therefore more data is required.

How many keys are found on an average keyboard?

(1) There are 20 number keys on an average keyboard.

(2) 20% of the keys on the keyboard are number keys.

The best answer is C.

Statement (1) gives us the number of number keys only and thus is insufficient.

Statement (2) alone is insufficient because it relates to the number stated in statement (1).

Both statements together are sufficient since we are told that 20 buttons is 20% of the total and therefore there are 100 buttons on the average keyboard.

What is the amount of interest paid on an X dollars loan over a 6 months period?

(1)  $X = 12,000$ .

(2) The interest rate is 5%.

The best answer is E.

Statement (1) gives out the amount of money loaned.

Statement (2) gives the interest with out mentioning during what time is the interest 5%.

Both statements are insufficient since we cannot determine what the interest on \$12,000 is during a 6 months period. The interest could be monthly or annually or anything else.

Merline made a \$360,000 mortgage on a house. How much interest total will she pay?

(1) The simple interest rate is 8.5% annually.

(2) It will take Merline 12 years to return the loan on the house.

The best answer is C.

Statement (1) implies that the annual interest is 8.5%. it is not sufficient by itself since we do not have the time period of the return.

Statement (2) implies that 12 years have passed until Merline paid the loan but we do not have the interest rate.

During the 12 years, we can calculate the interest every year until we reach 12 years. Both statements together are sufficient.

A simple interest can be calculated using the following formula:

Principle (money loaned or invested)\*rate (percent) \*time = interest paid

Nicola bought a new cellular phone. How much did it cost him?

- (1) Every month Nicola pays 45 franks to the cellular company, which includes the calls and the cellular device itself.
- (2) Every month, Nicola spends twice on calls than on the cellular device.

The best answer is E.

Statement (1) gives the total cost of the device and the calls, define C as calls and D as device. You can write the following equation:  $C + D = 45$ .

(1) is insufficient.

Statement (2) is also insufficient by itself, it implies that  $C = 2D$ .

(1) and (2) together are sufficient to find D and C but that is not enough.

D is the money spent on the device per month while we want the total price of the device.

If we knew how many months he paid we would have enough data.

How much did Nancy pay for her new air-conditioner?

- (1) Nancy paid 12 payments, one every month.
- (2) On April, Nancy paid \$130.

The best answer is E.

Statement (1) tells us that Nancy paid one statement every month.

Statement (2) gives us a specific payment on a specific month.

Each statement by itself is insufficient and (1) and (2) together are also insufficient since it is not mentioned that the all the payments are equal.

What is the perimeter of circle O?

- (1) The circle inscribes a square.
- (2) The perimeter of the square is 10.

The best answer is C.

If a circle encircles a square then the diagonal of the square is the diameter of the circle, which is sufficient to find the perimeter.

Statement (1) tells us about the square that is blocked with out any further data.

Statement (2) gives us the perimeter, which is equal to 4 times the side of the square.

If we know the side of the square, we know its diagonal.

Both statements, taken together, are sufficient.

A map is divided into blocks. Each block is 1 inch long and 1 inch wide. Every inch on the map represents 20 miles. What is the maximum actual total distance that the Flanders family traveled?

- (1) The Flanders were on three different adjacent blocks on the map.
- (2) The Flanders traveled in a straight line through the blocks.

The best answer is C.

Statement (1) is insufficient since we don't know how many times the family was in each block and how their trip looked like.

Statement (2) is also insufficient. It is not known through how many blocks the Flanders drove.

Both statements together are sufficient since the longest distance traveled through three blocks is the diagonal starting at the bottom corner of the lowest block and ending at the top opposite corner of the top block. The length of this line can be calculated using the pythagorean thorem.

A paint shop sells spray cans at a flat charge of 50 cents per can. If a customer bought 10 cans and the owner decided to give that customer a special discount on the last two cans, what was the price of the two discounted cans?

(1) The customer paid four dollars and twenty cents total for the ten cans.

(2) The customer bought the ten cans for an average price of 42 cents per can.

The best answer is D.

Statement (1) tells us that 10 cans cost 4.2 dollars instead of 5 dollars and therefore the last two cans were sold for 20 cents. This statement is sufficient.

Statement (2) also tells us that the entire amount of cans cost 4.2 and therefore this statement is also sufficient.

The line  $Y = X/2$  is drawn on a rectangular axis system. If the line is rotated, on which quadrant will he be found?

(1) The rotation is done counter clockwise.

(2) The line is rotated 270 degrees.

The best answer is C.

Draw an axis system and draw a line from the coordinate (0, 0) in the first quadrant.

From (1) we can learn that the rotation is done counter clockwise which is insufficient.

From (2) we can learn that the rotation is 270 degrees, but in which way?

Join the statements, we know that a 270 degrees turn counter clockwise was made and therefore the line is now in the fourth quadrant.

The line  $Y = 3X$  is drawn on a rectangular axis system. If the line is rotated, on which quadrant will it be found?

- (1) The rotation is done clockwise.
- (2) The line is rotated 180 degrees.

The best answer is B.

Draw an axis system and draw a line from the coordinate (0, 0) in the first quadrant.

From (1) we can learn that the rotation is done clockwise which is insufficient.

From (2) we can learn that the rotation is 180 degrees, but in which way? It doesn't matter since the rotation is half a circle, which in both ways will be parallel to the original position.

This statement is sufficient and the line will be in the third quadrant.

Travis parked at a certain parking lot that charges more for the first hour of parking than any other hour. If it cost Travis 5.5 dollars, how much time total did he park in the parking lot?

- (1) Parking charges are \$1.5 for the first hour and \$1 for any additional hour of parking or a part of it.
- (2) If the charges for the first hour were \$2 then Travis would have paid \$6 for parking.

The best answer is E.

Statement (1) gives the data on the charges but it says that every fraction of an hour is rounded up and therefore, even if Travis was 4 and 10 minutes, he still has to pay for 5 hours.

We cannot determine the exact time that Travis parked.

Statement (2) is insufficient since it doesn't change the accuracy problem introduced in (1).

More data is required.

12 liters of a certain water-based color contain A liters of water and B liters of color. How many liters of water are in the water-based color?

(1)  $A^2 + 16 = 8A$ .

(2)  $B^2 - 2B = 48$ .

The best answer is D.

Statement (1) can be written as:  $(A - 4)^2 \rightarrow A = 4$  and  $B = 12 - 4 = 8$ .

Sufficient.

Statement (2) can be written as:  $(B + 6)(B - 8) \rightarrow B = -6$  or  $B = 8$  but B must be a positive, so  $B = 8 \rightarrow A = 12 - 8 = 4$ .

Either statement by itself is sufficient.

Does the product of  $XYZW = 16$ ?

(1)  $Y = 1$ .

(2)  $X = 4Y$  and  $ZW = 4Y^2$

The best answer is C.

From (1) we know the value of Y only, which is 1.

From (2) and (1) we know the value of all the other parameters,  $X = 4$  and  $ZW = 4$ .

Therefore, (1) and (2) together are sufficient.

How many of the girls in a group of 200 children have an average score of 80 in their final exams?

- (1) 45% of the children have an average score of 80 in their final exams.
- (2) 50% of the children in the group are girls.

The best answer is E.

From (1) by itself we can only learn that 90 kids have good grades. This statement is insufficient.

From (2) we can learn that there are 100 girls in the group.

Combining the statements doesn't help much since we know nothing about the overlapping of (1) and (2) and more data is required.

From January 1948 to March 1981, the value of an antique house in the downtown area tripled. What was its value back in January 1948?

- (1) From March 1981 to September 2001, the value of the house doubled.
- (2) The value of the house in September 2001 was \$300,000.

The best answer is C.

Use both statements and solve the problem backwards.

In 2001 the value was \$300,000, which is double the value in 1981.

In 1981, the value of the house was \$150,000, which is triple the value in 1948.

In 1948, the value of the house was \$50,000.

Both statements, taken together, are sufficient.

If  $A = 2B$ , is  $A^4 > B^4$ ?

(1)  $A^2 = 4B^2$ .

(2)  $2A + B < A/2 + B$ .

The best answer is B.

Statement (1) is insufficient. Take  $A=0$  and  $B=0$ , (1) is correct yet  $A^4$  is not bigger than  $B^4$ .

Take different numbers,  $A=6$  and  $B=12$   $A^4$  is larger than  $B^4$ .

Statement (2) is sufficient. The only possible way that  $A$  will not be larger than  $B$  is if they are both zero. (2) claims that  $A < 0$  and therefore  $A$  cannot be zero and this statement is sufficient,  $A^4$  is bigger than  $B^4$ .

The Ponds basketball team played 45 games this season, how many did they win?

(1) The Ponds won their first 25 games in this season.

(2) The team won none of their last 5 games and of the rest they won 75%.

The best answer is B.

Statement (1) only refers to the first 25 games, all the others are unknown and therefore this statement is insufficient by itself.

Statement (2) is sufficient. The rest of the games after reducing the 5 last ones that were lost is 40 games. 75% of the 40 games give 30 games that the team won.

Is X negative?

(1)  $X + 12 < 0$ .

(2)  $12X > 14X$ .

The best answer is D.

Statement (1) is sufficient. Subtract 12 from both sides to get  $X < -12$  and therefore X is negative.

Statement (2) is also sufficient. In order for the left side of the inequality to be bigger than the right side, X must be negative.

Is A an odd integer?

(1)  $AB + AC$  is an even integer.

(2)  $B = 15 - C$ .

The best answer is C.

Statement (1) can be written as  $A(B + C)$ , which means that A or  $(B+C)$  must be even.

Statement (2) tells you that  $(B + C)$  is odd and therefore, using statement (1) A must be even.

Both statements, taken together, are sufficient.

Is Y even?

(1)  $WX + YW + ZW$  is an odd number.

(2)  $X = 8 - Z$ .

The best answer is C.

From (1) we can learn that  $W(X + Y + Z)$  is odd and therefore W is odd and also  $(X+Y+Z)$ .

From (2) we can learn that  $(X+Z)$  is even.

Use both statements together:  $(X + Y + Z)$  is odd yet  $(X + Z)$  is even and therefore  $Y$  must be odd.

In the past few years, the import of cars to Italy increased significantly. In the years 1994 to 2001 the number of imported cars increased by 12% each year. How many cars were imported to Italy in the year 2000?

(1) In 1997, 12,500 cars were imported to Italy.

(2) During the years 1997 to 1999, 42,180 cars total were shipped to Italy.

The best answer is D.

From the question we know that the number of cars grew by 12% each year.

From (1) we can learn that if in 1997 12,500 cars were shipped then in 1998  $(1.12 \times 12,500)$  cars were shipped and so on until 2000. This statement is sufficient.

From (2) we can learn that during a certain period 42,180 cars were shipped, if you define  $X$  as the number of cars that were shipped in 1997 then:  $42,180 = X + 1.2X + 1.2(1.2X)$  and so we can find  $X$  and anything else we wish to find. Either statement alone is sufficient.

Mike spends 50% of his time studying and 20% of the rest of his time going to the Jym. Jim spends 60% of his time in the Jym and 85% of the rest of his time studying. How many hours more does Mike spend on studying than Jim?

(1) Jim spends 22 hours a week on working out.

(2) Mike spends 18 hours a week on studying for the finals.

The best answer is C.

(1) Is insufficient since it gives us information regarding Jim only.

(2) Is insufficient since it gives us information regarding Mike only.

In order to compare the number of hours Mike and Jim spend studying, we need a real data regarding the number of hours each spends on any activity. Therefore, we need to use both statements.

5 numbers are randomly chosen. If their average is 20, how many of the numbers are larger than 15?

- (1) One of the numbers is 15.
- (2) The average of three of the numbers is 15.

The best answer is E.

Use both statements.

Lets look at two cases, where each one will give out different results.

One of the numbers is 15 and three more are 15, 15 and 15 (with an average of 15).

The sum of all the numbers should be ( $20 \times 5 = 100$ ).

The sum of the numbers we picked up is ( $15 \times 4 = 60$ ) and therefore the last number should be 40 which is greater than 15. The answer in this case is 1.

Take another case: One of the numbers is 15 and three more are 14, 15 and 16 (with an average of 15). In this case there will be 2 numbers over 15. More data is required.

A certain basketball player receives a \$700 bonus for every dunk that he performs and a \$1,000 bonus for every game that the team wins. Last month, the player earned \$9,100 on bonuses only, how many dunks did he preform last month?

- (1) Last month the player preformed at least 3 dunks.
- (2) The number of dunks, last month, was two and a half times smaller than the number of wins.

The best answer is B.

Statement (1) is insufficient since it gives two possible options: 13 dunks or 3 dunks and 7 wins.

Statement (2) is sufficient since it eliminates all the answers but one: 7 wins and 3 dunks.

Bob earns twice as much as Bobby and Bobby earns two thirds as much as Buddy does. How much did Bob earn?

(1) All three earn a total of 18,000 dollars.

(2) Buddy earns \$6,000.

The best answer is D.

Pay attention, the question presents two equations with three unknowns and therefore one more equation is required in order to solve the question.

Statement (1) is sufficient since it presents another equation.

Statement (2) is also sufficient since it tells us one of the unknowns.

Either statement alone is sufficient.

If  $(4 \# 2 = 14)$  and  $(2 \# 3 = 6)$ , what can replace  $(a \# b)$ ?

(a)  $ab$ .

(b)  $(a+3)b$

(c)  $a^2 - b$ .

(d)  $a^b - 2$ .

(e)  $b^a + 1$ .

The best answer is D.

Plug in the answers.

(a)  $(4 \# 2) = 8$ . The answer should be 14.

(b)  $(2 \# 3) = (2 + 3)3 = 15$ . The answer should be 6.

(c)  $(2 \# 3) = (2^2 - 3) = 1$ . The answer should be 6.

(d)  $(4 \# 2) = (4^2 - 2) = 14$ . This is the right answer, check  $(2 \# 3)$  also.

What is the value of the integer X?

(1)  $X^2 = 81$ .

(2) X is a square of a prime number.

The best answer is C.

Statement (1) is insufficient since X can be either 3 or -3.

Statement (2) is insufficient since X can be  $2^2, 3^2, \dots$

Both statements together are sufficient since (2) eliminates the negative option of (1).

X is 3.

What is the value of P?

(1) P is even.

(2) P is a square of a prime number?

The best answer is C.

Statement (1) alone is insufficient since there is infinite number of possibilities.

Statement (2) alone is insufficient since there are lots of prime numbers.

The combination of the statements is sufficient since the only even square of a prime number is can be  $2^2$ , which is 4. Both statements, taken together, are sufficient.

If  $AB = 40$ , what is the value of  $AB(A + 2B)$ ?

(1)  $A - B = -18$ .

(2)  $A^2B = 80$ .

The best answer is B.

Statement (1) alone is insufficient since we need the value of  $A + 2B$ .

Statement (2) is sufficient.  $A^2B = A(AB) = A(40) = 80 \rightarrow A=2$  and  $B=20$ .

Now, we know that  $A + 2B = 42$  and we can calculate the required expression.

If  $X^3Y = 24$ , what is the value of  $(X^3Y^3 - X^2Y^2)$ ?

(1)  $X^2Y^2 = 36$ .

(2)  $X^3Y^2 = 72$ .

The best answer is B.

Statement (1) is insufficient since the expression given is only one of two needed.

Statement (2) by itself is sufficient since  $X^3Y^2 = (X^3Y)Y = 24Y = 72 \rightarrow Y = 3$ .

If  $Y=3$  then  $X^3=8$  and so  $X=2$ .

The expression required is a combination of X and Y and therefore it is calculable.

There are two bus routes that go through the chapel and the cemetery. For each route, the bus company may use one of two types of buses, a standard bus or a duplex bus. How many passengers total can travel in the duplex bus?

(1) When both buses are used for the routes, as many as 90 passengers can travel from the chapel to the cemetery.

(2) On Saturday, the busiest day of the week, two duplex buses are used for each of the routes and as many as 120 passengers can travel from the chapel to the cemetery.

The best answer is C.

Define S as the number of passengers that can travel in the standard bus and D as the number of passengers in the duplex bus.

Statement (1) can be written as  $S + D = 90$ . Insufficient.

Statement (2) can be written as  $2D = 120$ .

Combine the statements, you got all the data you need to solve the question and therefore they are sufficient together.

X equals to Y% of what number?

(1)  $X = 3Y$ .

(2)  $6Y + 2X = 56X/14$ .

The best answer is D.

From (1) we have X and Y and therefore we can find A easily,  $A = 300$ .

(2) is identical to (1), simplify it and see that it can be written as  $X = 3Y$ .

Either statement by itself is sufficient.

Which expression is larger  $1/(5 - X)$  or  $X/5$ ?

(1)  $X < 8$ .

(2)  $X > -8$ .

The best answer is E.

The easiest way to solve such a problem is to plug in numbers.

Use both statements to see that they are both insufficient even together.

Take  $X=0$ :  $1/(5 - X) = 1/5$  and  $X/5 = 0$ , in this case the first expression is larger.

Take  $X=7$ :  $1/(5 - X) = -1/2$  and  $X/5 = 7/5$ , in this case the second expression is larger.

We can see that the answer is dependent on which numbers we choose and more data is required in order to determine the answer.

X is a two-digit number. If the ratio between the units digit and the tens digit is 1 to 2, what is the value of X?

- (1) The sum of the digits multiplied by the tens digit is 54.
- (2) The product of the digits divided by 2 is 9.

The best answer is D.

There are a limited number of possibilities: 21, 42, 63 and 84.

According to statement (1), the only number that is compatible is 63.

According to statement (2), the only number that is compatible is also 63.

Either statement alone is sufficient.

- (a) \$455.
- (b) \$525.5.
- (c) \$675.
- (d) \$810.5.
- (e) \$864.5.

The best answer is E.

5% of the total price of the cloths is 45.5 dollars, multiply this number to get the entire 100% of the total selling price:  $(45.5 \times 20 = \$910)$ . Now subtract the profit \$45.5 to get the cost:  $910 - 45.5 = \$864.5$ .

The bus that travels from St. Louis to Chicago and back comes to St. Louis every 4 hours while the bus that travels from St. Louis to Springfield and back comes to St. Louis every 6 hours. If at 12:00 o'clock both buses arrived at St. Louis, at what time will they meet in St. Louis again?

- 16:00.
- 18:00.
- 20:00.
- 22:00.
- 24:00.

The best answer is E.

In order for both buses to meet again, we ought to look for the smallest common factor of 4 and 6, thus 12 hours. After 12 hours one of the buses will complete 3 roundtrips while the other will complete only 2, they will meet at  $(12:00 + 12 = 24:00)$ .

Monica planned her birthday party. She prepared 5 muffins for each of her guests and kept aside two additional muffins in case someone will want extra. After the party, it turned out that one of the guests didn't come but every one of the guests that did come ate six muffins and 3 muffins remained. How many guests did Monica plan on?

- 3.
- 4.
- 5.
- 6.
- 7.

The best answer is C.

X is the number of guests that were supposed to show up at the party, and so Monica prepared  $5X + 2$  muffins.  $(X - 1)$  is the number of guests that did come to the party and the total number of muffins is  $6(X - 1) + 3$ . The number of muffins that Monica prepared is equal to the total number of muffins and so we can compare the following expressions:  $5X + 2 = 6(X - 1) + 3 \rightarrow X = 5$ .

If  $\frac{1}{3} < A < 2$ , which of the following expressions can have the largest value?

$A^2/3$ .

A.

$A/2 + 1/3$ .

$A + 1/3$ .

$A^3 - 4$ .

The best answer is E.

Try the answers for the largest and smallest values A can get.

Take  $A = 1.9$ , answer E will be the largest and so this is the expression that can be the largest among the other expressions.

In an isosceles triangle the sum of the sides is 2 inches longer than the base. What is the ratio between the length of the side and the length of the base?

1.5

1.

1.75.

2.

Not enough information.

The best answer is E.

Try taking the base of the triangle as 1 inch. Both of the sides are 3 inches.

And the portion required is  $(1.5 / 1) = 1.5$ .

Try taking different numbers, take 10 inches as the length of the base.

The length of both sides is  $(10 + 2 = 12$  inches).

The portion required is  $(6 / 10)$ .

We can see that a randomly pick of two numbers will give two different answers and therefore there is no distinct answer.

Tim and Élan are 90 miles away from one another. They are starting to move towards each other simultaneously, Tim at a speed of 10 Mph and Élan at a speed of 5 Mph. If every hour they multiply their speeds, what is the distance that Tim will pass until he meets Élan?

- 30 miles.
- 35 miles.
- 45 miles.
- 60 miles.
- 65 miles.

The best answer is D.

Tim is traveling at twice the speed of Élan, and so will be after they multiply their speeds.

In other words, their speeds will always be at a 2:1 ratio no matter what and therefore the ratio between the roads that they'll pass will also be 2:1 or 60 miles to 30 miles. Tim will go through 60 miles.

The distance between West-Town to East-Town is 15 kilometers. Two birds start flying simultaneously towards one another, the first leaving from West-Town at a speed of 4 kilometers per minute and the second bird, leaving from East-Town, at a speed of 1 kilometers per minute. What will be the distance, in kilometers, between the meeting point and West-Town?

- 3.
- 7.
- 10.
- 12.
- 15.

The best answer is D.

The ratio between their speeds is 4:1 and so will be the ratio between the distances that they'll pass.

The first bird will pass a distance of 12 Km and the second bird will pass only 3Km.

The meeting point will be 12 Km from West-Town.

A car traveled from San Diego to San Francisco at an average speed of 48 miles per hour. If the journey back took twice as long, what was the average speed of the trip?

- 24.
- 32.
- 36.
- 42.
- 44.

The best answer is B.

Average speed can be found by dividing the total distance by the total time. If the journey back took twice as long then the car traveled at half the speed, thus 24-mph. Take the time the car traveled from San Diego to San Francisco as  $T$ , and the time it took to get back as  $2T$ . The total distance is  $48T + 24 * 2T = 96T$ , now divide it by the total time,  $3T$  to get 32 mph.

What kind of flowers does a florist have more of, lilacs or roses?

- (1) The number of roses he has is less than 6 times the number of lilacs that he has.
- (2) One fifth of the number of Lilacs is less than the number of roses that he has.

The best answer is E.

Define  $R$  as the number of roses and  $L$  as the number of lilacs.

From the first statement we can write the following inequality:  $R < 6L$ .

Both  $L = 1$  and  $R = 2$ ,  $L = 2$  and  $R = 1$  fit the inequality and therefore this statement is insufficient.

From statement (2) we can write the following inequality:  $L/5 < R$ .

Both  $L = 1$  and  $R = 2$ ,  $L = 2$  and  $R = 1$  fit the inequality and therefore this statement is insufficient.

Both statements combined are also insufficient, use the same numbers to prove it and therefore more data is required.

If “Alfa” is defined as 2 percent of 5 degrees, how many “Alfa’s” are there in two circles?

0.72.

7.2.

72.

720.

7200.

The best answer is E.

“Alfa” is defined as  $(0.02 \times 5 \text{ degrees} = 0.1 \text{ degrees})$ .

In a circle there are 360 degrees, in two circles there are 720.

$(720 \text{ degrees} / 0.1 = 7200 \text{ “Alfa’s”})$  in two complete circles.

What percent is A of B?

(1) B is 32 more than the square root of A.

(2) A is more than 12 less than B/2.

The best answer is E.

In this question you have two unknowns, A and B, and thus you need two equations.

Statement (1) is not enough to find A and B.

Statement (2) can be written as:  $A > B/2 - 12$ .

The second statement is an inequality and not an equation and another equation is needed to solve the question.

What percent is X of Y?

(1) Y is bigger than 2X by 54.

(2) X is smaller than 3Y by 72.

The best answer is C.

Statement (1) can be written as:  $Y = 2X + 54$ .

Statement (2) can be written as:  $X = 3Y - 72$ .

Combining both statements, we have two different equations containing X and Y and so we can solve and find the value of X and Y and calculate what is X percent of Y.

A store bought Q windows at \$150 per window and W shelves at \$75 per shelf. What is the total price of the windows and the shelves?

(1) The Q windows cost \$600.

(2)  $Q + W/2 = 12$ .

The best answer is B.

Statement (1) is all about the windows and therefore it's not sufficient by itself.

Statement (2) tells us that  $Q + W/2 = 12$ , this is sufficient because the total price of windows and shelves is  $150Q + 75W$ .

Multiply the data in statement (2) by 150 to get:  $150Q + 75W = 18,000$ .

Statement (2) is sufficient by itself.

What is the smallest possible common multiple of three integers, all larger than 26?

- 27.
- 54.
- 846.
- 19,656.
- 21,924.

The best answer is A.

All of the integers have to be greater than 26, thus 27 and up. The question didn't mention that they have to be different and so they can all be equal to 27.

The smallest common multiple of 27 is 27 itself.

What is the smallest possible common multiple of two integers, both bigger than 260?

- 261.
- 262.
- 524.
- 12,542.
- 18,244.

The best answer is A.

All of the integers have to be greater than 260, thus 261 and up. The question didn't mention that they have to be different from one another and so they can all be equal to 261.

The smallest common multiple of 261 is 261.

A customer asks the clerk for a paintbrush and a bucket of whitewash for a total price of  $B$  dollars. If the paintbrush costs 200 cents less than twice the price of a bucket of whitewash, what is the price of half a bucket of whitewash in dollars?

$$(B + 200)/2.$$

$$(B + 2)/6.$$

$$(2B + 200)/3.$$

$$(B + 2)/3.$$

$$(B + 2)/6.$$

The best answer is E.

Define  $W$  as the price of the bucket of whitewash and  $P$  as the price of a paintbrush.

You can write the following equations:  $P + W = B$  and  $P = 2W - 2$ .

Notice that 200 cents are translated into 2 dollars.

From the equations we can conclude that  $W = (B + 2)/3$ .

Therefore the price of half a bucket is  $(B + 2)/6$ .

If 34 boxes of cucumbers in brine cost  $A$  dollars, how much will  $B$  boxes cost in cents?

$$AB/34.$$

$$17AB/50.$$

$$34/AB.$$

$$50AB/17.$$

$$100AB/17.$$

The best answer is D.

If 34 boxes cost  $A$  dollars then one box costs  $A/34$  dollars or  $100A/34$  cents =  $50A/17$ .

$B$  boxes will cost  $B \times 50A/17 = 50AB/17$ .

If X boxes of pineapple juice cost 342 cents, how much will Y boxes cost in dollars?

$$342Y/X.$$

$$X/(342Y).$$

$$XY/(342).$$

$$3.42X/Y.$$

$$3.42Y/X.$$

The best answer is E.

If X boxes cost 342 cents (or 3.42 dollars), then each box costs

$$3.42/X.$$

Y boxes will cost  $3.42Y/X$ .

Jeremy bought 2Q steaks for W dollars. Jerome buys R steaks for a 50% discount, how much will the steaks cost him in cents?

$$50RW/Q.$$

$$50QR/W.$$

$$25RQ/W.$$

$$25RW/Q.$$

$$RW/(4Q).$$

The best answer is D.

Jeremy paid W dollars (or 100W cents) for 2Q steaks and therefore each steak cost him  $50W/Q$ .

Jerome has a 50% discount, so every steak costs him  $25W/Q$ .

Jerome wants to buy R steaks; it will cost him  $25RW/Q$ .

An electrical appliances store sold this month 400% more than the average of all the other months in the year. The sales total for this month was approximately what percent of total sales for this year?

- 14%.
- 21%.
- 31%.
- 37%.
- 43%.

The best answer is C.

Plug in 1\$ as the sales for each of the other 11 months.

On that special month, the store sold 400% more (400% of 1 is 4), or \$5. The sales of this month relative to the sales of the entire year are  $5/(11 + 5)$ .  $5/16$ , which is a bit less than  $1/3$  (33%).

What is the units' digit of  $(9)^7(17)^3(3)^3$  ?

- 3.
- 5.
- 7.
- 8.
- 9.

The best answer is E.

$(17)^3(3)^3 = (17 \times 3)^3 = (51)^3 = 51 \times 51 \times 51$  ---> the units' digit is just  $1 \times 1 \times 1 = 1$ .

We are left with the units' digit of  $9^7$ .

$(9)^7 = 9 \times 81 \times 81 \times 81$  ---> the units' digit is 9.

And therefore the units' digit of the entire expression is 9.

A certain factory produces buttons and buckles at a uniform weight. If the total weight of 2 buttons and 2 buckles is one third of 11 buckles and 3 buttons, then the weight of 3 buttons and 2 buckles is how many times that of 5 buckles and 6 buttons?

- 7/15.
- 4/9.
- 6/11.
- 5/9.
- 8/15.

The best answer is A.

Define B as the weight of a button and K as the weight of a buckle.

The total weight of (2B + 2K) is equal to  $\frac{1}{3}(11K + 3B) \rightarrow 3B = 5K$

$B = 5K/3$ .

The question requires the ratio between (3B + 2K) and (5K + 6B).

The first factor is equal to (5K + 2K = 7K).

The second factor is equal to (5K + 2(5K)) = (15K).

The ratio between them is 7:15 and therefore the first factor is 7/15 of the second one.

In a recent survey, Q people were asked whether they eat after 22:00 O'clock. 25 percent of the people answered positively and 40 percent of the rest were asked, at what time do they get up in the morning. Which of the following expressions represents the number of people who do not eat after 22:00 and were not asked about the time they get up in the morning?

- 3Q/20.
- Q/10.
- 5Q/9.
- 3Q/10.
- 9Q/20.

The best answer is E.

75Q/100 is the number of people who eat after 22:00. 60% of that number is the number of people who weren't asked upon, when do they get up at the morning.

$60 \times (75Q/100) / 100 = 45Q/100 = 9Q/20$ .

In a recent tender,  $X$  people participated. 35% of the  $X$  people, who made an offer won the specific tender they participated in. 70% of the rest, were disappointed from the result of the tender. Which of the following expressions represents the number of people who weren't disappointed although they didn't win the tender?

$39X/200$ .

$25X/50$ .

$19.5X/200$ .

$35X/250$ .

$90X/200$ .

The best answer is A.

$65X/100$  is the number of people who didn't win the tender. 30% of that number is the number of people who weren't deeply disappointed about the fact that they didn't win.

$30 \times (65X/100) / 100 = 19.5/100 = 39/200$ .

A and B are integers. The expression  $(A+1)(B+1)$  is even.  
What can be said about A and B?

They are both even numbers.

At least one of them is even.

At least one of them is odd.

They are both odd.

Nothing can be said surly on A and B.

The best answer is C.

Because the given expression is even, at least one of the phrases in one of the parenthesis must be even therefore either A or B must be odd.

In orange county one fifth of the people are gathering mushrooms and one seventh of the people are collecting apples. What can be the number of people in Orange County?

- 60.
- 42.
- 85.
- 140.
- 252.

The best answer is D.

The answer must be a number that is divisible by both seven and four.  
The only possible number is 140.

In Tukitu village, one forth of the people are raising flowers, one ninth are growing wheat and one eleventh are growing vegetables.  
What could be the number of people in the village?

- 792.
- 540.
- 198.
- 132.
- 346

The best answer is A.

The answer must be a number that is divisible by 4, 9 and 11 together.  
The only possible answer is A.

Danny can divide his herd into 5 equal parts and also to 6 equal parts, but not to 9 equal parts. What could be the number of cows Danny has in his herd?

155.

336.

180.

120.

456

The best answer is A.

The number of cows is divisible by 5 and 6 but not by 9. Meaning it must end with a 5 or a 0 and be divisible by 3 (the sum of its digits is divisible by 3). That leaves answers C and A only. However, 180 is also divisible by 9 and is ruled out.

The number of bunnies in Peter's yard increases by 4 times every week. How many weeks will it take for the number of bunnies to be divisible by 8 assuming that he started out with 3 bunnies?

- 1.
- 2.
- 3.
- 4.
- Never.

The best answer is B.

In the beginning he has 3, one week later he has 12 and two weeks later he has 48 and that can be equally divided by 8.

If  $X = 2^3 \times 5^2 \times 7$ , then the expression  $X/8$  is not divisible by:

- 1.
- 2.
- 5.
- 7.
- 25.

The best answer is B.

From the given expression we learn that  $X/8 = 25 \times 7$ , which is not divisible by 2.

The remainder when dividing the expression  $(X + Y)$  by 5 is 4.  
The remainder of  $X$  divided by 10 is 2. What is the remainder of  $Y$  divided by 5?

- 1.
- 2.
- 3.
- 4.
- 5.

The best answer is B.

Plug in numbers that fit the conditions.  $(X+Y) = 19$  and so  $19/5$  gives a remainder of 4.  $X = 12$  and so  $12/10$  gives a remainder of 2.  
Therefore  $Y$  is 7.  $7/5 = 1$ . The remainder is 2.

$Q$  is a prime number larger than 10. What is the smallest positive number (except 1) that  $3Q$  can be equally divided by?

- 3Q.
- Q
- 3
- Q+3
- 2Q

The best answer is C.

$3Q$  is a prime number so it can be divide equally by  $3Q$ , by 1 and by the components 3 and  $Q$ . The smallest number is 3.

A is a prime number ( $A > 2$ ). If  $C = A^3$  than in how many different integers is C divisible?

- 5
- 6
- 3
- 4
- 7

The best answer is B.

Factorize C:  $C = A \times A \times A$ . Therefore C can be equally divided into 1, A,  $A^2$ , and  $A^3 = C \rightarrow 4$  numbers all together.

A can be divided by 11 with no remainder. Which of the following expressions could be divided by 11 leaving a remainder of 1?

- A-20.
- A-12.
- A-9.
- A-10.
- A-13.

The best answer is D.

$A/11=X$ , so  $A=11X$ . Now change A in answer D with 11X to get:  $11X-10$ . Plug in numbers in X to find out if it could leave a remainder of 1 when divided by 11.

Let's try  $X=2$  and  $A = 22$ . In expression D:  $22-10=12$ .

$12/11 = 1$  with a remainder of 1. try plugging the same number (2) to each of the expressions to find the right answer.

Eggs are sold in packages of six or eleven only. If Doris bought 70 eggs exactly, what could be the number of large packs Doris bought?

- 6.
- 2.
- 3.
- 5.
- 4.

The best answer is B.

If she bought 2 large packs (22 eggs) then she has 48 eggs left. 48 eggs can be equally divided into eight boxes of 6.

A, B, C are three consecutive positive integers ( $A > B > C$ ).  
What is the value of the expression  $2A + B + 3C$ ?

- 6A+7.
- 5A+1.
- 5A-1.
- 6A-5.
- 6A-7.

The best answer is E.

A different way is by expressing B and C according to A.

$C = A - 2$ ,  $B = A - 1$ . So the expression becomes:  $2A + (A-1) + 3(A-2)$   
 $= 6A - 7$ .

Q, R, S, and T are four consecutive positive numbers. Which of the following expressions must be odd?

QR + ST.

Q + R + S + T.

$Q^2 + S^3$ .

$Q^2 + R^2$ .

$Q^2 + 2R$ .

The best answer is D.

You can ignore the powers since odds and evens remain as they were under powers. Q and R are consecutive numbers and therefore one of them is even and the other one is odd. The result of the sum of an even number and an odd number must be an odd number.

X, Y and Z are consecutive numbers ( $X > Y > Z$ ).  $X + 2Y + 3Z = 5Y + 4$ .  
What is Z?

5.

6.

3.

4.

2.

The best answer is A.

Use the answers to backsolve.

$$X + 2Y + 3Z = 5Y + 4 \rightarrow X + 3Z = 3Y + 4$$

Lets try the first answer:  $Z = 5$ , so  $Y = 6$  and  $X = 6$ .

Lets check the equivalence:  $7 + 15 = 22 = 18 + 4$ .

The sum of 3 consecutive numbers is definitely:

Positive.

Divisible by 2.

Divisible by 3.

Divisible by 4.

Divisible by 5.

The best answer is C.

This is a rule: The sum of 3 consecutive integers is divisible by 3. For example take  $3 + 4 + 5 = 12$ .

$$35^2 - 34^2 = ?$$

$$35 - 34.$$

$$35 + 34.$$

$$35^2.$$

$$2 \times 35 \times 34.$$

$$34.$$

The best answer is B.

$$35^2 - 34^2 = (35 - 34)(35 + 34) = 1(35 + 34). \text{ B is the answer.}$$

Which of the following expressions is independent to variable X?

(a)  $(4X - 3)/(X - 3)$ .

(b)  $X - (1 + 2X)/2$ .

(c)  $4X - 1 - 4(1 - X)$ .

(d)  $(X + 2)^2 - X^2$ .

(e)  $X/(4X) + 4X/4$ .

The best answer is B.

Simplify all the expressions to see where X disappears.

Answer B:  $X - (1+2X)/2 = X - 1/2 - X = -1/2$  and this answer as you can see is not dependent on the variable X.

If  $4XZ + YW = 3$  and  $XW + YZ = 6$ , what is the value of the expression  $(2X + Y)(2Z + W)$  ?

9.

18.

16.

12.

15.

The best answer is E.

$$(2X + Y)(2Z + W) = 4XZ + 2XW + 2ZY + WY.$$

Now, place the given data to get:  $3 + 2 \times 6 = 15$ .

If  $(A + 2)^2 = (A + 5)^2$ , what could be the value of A?

- 1.5.
- 2.5.
- 3.5.
- 2.5
- 3.

The best answer is C.

Plug in the answers to backsolve this question. Input  $A = -3.5$  and you'll get  $(-1.5)^2 = (1.5)^2$ .

If  $A^2(B + C) = 20$ , (A, B and C are all integers bigger than 1), what is the value of the expression  $(B + C - A)$ ?

- 1.
- 2.
- 3.
- 4.
- 9.

The best answer is C.

Because they are all integers bigger than 1, the only multiplication can be  $4 \times 5 = 20$ . Because A is an integer,  $A^2$  can't be 5 therefore its 4 ( $A = 2$ ).  $A = 2 \rightarrow B + C = 5$ .  $B + C - A = 5 - 2 = 3$ .

If  $(A-B-C+D = 13)$  and  $(A+B-C-D = 5)$ , what is the value of  $(B-D)^2$ ?

- 16.
- 64.
- 8.
- 4.
- 12.

The best answer is A.

Subtract equation 2 from equation 1 and you'll get:  $-2B + 2D = 8 \rightarrow (B-D)^2 = 16$ .

If  $(A+B) = 4$ ,  $(B+C) = 9$  and  $(C+D) = 3$ , what is the value of  $(A+D)$ ?

- 16.
- 2.
- 7.
- 2.
- 8.

The best answer is A.

Take equation 1 + equation 3 – equation 2 and you'll get  $4 + 3 - 9 = -2$ .

If  $X^2 + Y^2 = A + 3$ ,  $XY = 7$  and  $(X + Y)^2 = 25$ , what is the value of A?

- 11.
- 6.
- 8.
- 5.
- 4.

The best answer is D.

$A + 3 = X^2 + Y^2 = (X + Y)^2 - 2XY = 25 - 7 \times 2 = 11 \rightarrow A = 8$ .

If  $4 - X < (2 - 5X)/3$ , which of the following is correct?

- $X < -5.$
- $X > -5.$
- $X > 5.$
- $-5 < X < 0.$
- $0 < X < 5.$

The best answer is A.

Multiply both sides by 3:  $12 - 3X < 2 - 5X \rightarrow X < -5.$

If  $Y < X$  and  $XM < YM$ , what must be true?

- $M < X.$
- $M < Y.$
- $X < 0.$
- $M < 0.$
- $Y < 0.$

The best answer is D.

If  $Y < X$ , multiply both sides by  $M$  and see that  $M$  must be negative since it changed the sign of the inequality. Remember that multiplying both sides of an inequality by a negative number reverses the direction of the inequality sign.

If  $X = (Y/Z)$ ,  $(-1 < Z < 0)$  and  $4 < Y$ , which of the following is correct?

- $X > 4.$
- $0 < X < 4.$
- $-4 < X < 0.$
- $X < -4.$
- $X < -20.$

The best answer is D.

Plug in numbers that fit the conditions of the question,  $Y=5$ ;  $Z = -1/2 \rightarrow X = 5/(-1/2) = -10.$

If  $(B+A < B - A < A - B)$ , which of the following is correct?

$$A < B < 0.$$

$$B < A < 0.$$

$$B < 0 < A.$$

$$0 < B < A.$$

$$B > A > 0.$$

The best answer is B.

Divide the equation in to two:  $(B+A < B - A)$  and  $(B - A < A - B)$ .

From the first one:  $A < 0$ . From the second one:  $A > B$ . Therefore B is the answer.

A is an integer. Which of the following expressions must be even?

$$A(A+2) - 1.$$

$$A(A - 1) + 1.$$

$$(A+1)(A+2).$$

$$(A - 1)(A + 3).$$

$$A^2 - 1.$$

The best answer is C.

Answer C is a multiplication of two consecutive numbers, therefore one of them must be even, and an even number multiplied by a different number is an even number.

$N$  is a prime number bigger than 5. Which of the following expressions must be even?

- $(N+2)^2$ .
- $N^2+2$ .
- $N(N+2)$ .
- $(N+1)(N+2)$ .
- $(N-2)^2$ .

The best answer is D.

Answer D is a multiplication of two consecutive numbers, therefore one of them must be even, and an even number multiplied by a different number is an even number.

$X$  and  $Y$  are integers. If  $(4X + 3Y = 3Y - X)$ , which of the following is true?

- $X$  is even.
- $X$  is odd.
- $Y$  is even.
- $Y$  is odd.
- None of the above.

The best answer is A.

$4X + Y = 3Y - X \rightarrow 3X = 2Y$ . The right side of the equation is definitely even. Therefore  $X$  must also be even since it is multiplied by an odd number (3).

To a prime number bigger than 2, 1 is added, the result is multiplied by three. What can be the result of these actions?

- 51.
- 54.
- 43.
- 41.
- 53.

The best answer is B.

A prime number bigger than 2 must be odd, adding one to that number gives you an even number, multiply that number by 3 and again the result is even. The only even answer is B.

A seven-digit phone number is divisible by 3. After adding the two digits of the area code the number is not divisible by 3, which of the following cannot be the area code?

- 06.
- 02.
- 07.
- 04.
- 05.

The best answer is A.

Adding one number that is divisible by 3 to another, the result will still be a number that is divisible by 3; the only number among the answers that is divisible by 3 is 06.

In a Greek restaurant there is a custom to break plates during celebrations. If after 8 celebrations there were only 6 plates left, which of the following could be the original number of plates before the celebrations?

- 30.
- 32.
- 34.
- 36.
- 40.

The best answer is A.

Take answer A: start with 30 plates; take out 6 so you have 24. 24 is divisible by 8 (celebrations).

If  $a$ ,  $b$ ,  $c$  and  $d$  are consecutive integers ( $a < b < c < d$ ).  
What is the value of  $(d+c) - (b+a)$ ?

- 1.
- 2.
- 3.
- 4.
- 0.

The best answer is E.

Plug in some numbers. Try  $a=1$ ,  $b=2$ ,  $c=3$  and  $d=4$ .

$(d+c) - (b+a) = 7 - 3 = 4$ . It will work with any number since the difference between any two consecutive integers is always 1.

$A$ ,  $B$  and  $C$  are consecutive integers. If  $X = (A \times B \times C)/2$ , what can be said about  $X$ ?

- X is even.
- X is divisible by 3.
- X is divisible by 5.
- X is positive.
- X is a fraction.

The best answer is B.

A product of three consecutive integers is divisible by 6, therefore when divided by 2 it is still divisible by 3.

If  $A$ ,  $B$  and  $C$  are consecutive integers ( $A < B < C$ ) and  $6A - 4B = A$ , what is the value of  $C$ ?

- 6.
- 5.
- 4.
- 3.
- 2.

The best answer is A.

$B$  is the number following  $A$ , thus  $6A - 4(A+1) = A \rightarrow A = 4 \rightarrow C = 6$ .

A cup can hold one third of the amount a bowl can hold. A pot can hold six times more than a cup. How many pots can be filled with a liquid that takes up 6 bowls?

- 1.
- 2.
- 3.5.
- 4.
- 5.5.

The best answer is B.

Try some numbers. One cup can hold 1 liter → one bowl can hold 3 liters, a pot can hold 9 liters.

6 bowls hold 18 liters and that can fill up two pots.

Michael, Steve and Tyler shared a box of cookies. Michael ate  $\frac{1}{8}$  of the cookies, Steve ate one half and Tyler ate 150 more cookies than Michael. If no cookies remain in the box, how many cookies were in the box?

- 1200.
- 600.
- 800.
- 400.
- 550.

The best answer is C.

The fastest way is to try the answers, take 600. Michael ate  $(\frac{600}{8})$  75 cookies, Steve ate 300 and Tyler ate 225. Adding the numbers and you'll get 600 cookies again.

The price of a pasta box in the neighborhood grocery store is \$7; the price of a pasta box in the market is \$5. A bus ticket to the market costs \$4.70 (one way). What is the minimum number of pasta boxes that must be bought so the trip would be economically worthwhile?

- 5.
- 6.
- 3.
- 4.
- 7.

The best answer is C.

The price difference between the two places is  $(7 - 5) = \$2$  per box. The bus ride back and Forth is \$9.4. If he buys at least 5 boxes the trip to the market will be worthwhile.

Following an increase in prices, the price of a candy box was 10 pounds and the price of a can of soda was 6 pounds. If the price of a candy box was raised by 25%, and the price of a can of soda was raised by 50%. What was the price of a box of candy plus a can of soda before prices were raised?

- 11.
- 12.
- 13.
- 14.
- 14.5.

The best answer is B.

For the candy box, 10 pounds is 125%; therefore the original price was 8 pounds.

The same thing goes with the soda, 6 pounds is 150%, and therefore the original price was 4.

The price of both products together was 12p before the rise.

In a chocolate store, all chocolates are either vanilla or cocoa flavored only. 10% of the chocolates are cocoa flavored, 90% of the rest are squashed. What percentage of the chocolates are both vanilla flavored and not squashed?

- 1%
- 5%
- 9%
- 10%

2%

The best answer is C.

Pick a number of chocolates; it is best to take 100 as an example.

10 are cocoa, 90% of the rest ( $0.9 \times 90 = 81$ ) are squashed.

That means that only 9 are both vanilla flavored and not squashed.

Z is 120% of Y. X is smaller than Z by 80%.

What percentage is X of Y?

96%

24%

50%

40%

45%

The best answer is B.

Pick numbers:  $Y=100 \rightarrow Z=120 \rightarrow X = 0.2 \times 120 = 24$ .

$X/Y = 24\%$

A baker sold all of his donuts for a total amount of 216 pounds. If on each donut the baker made a profit of 8% of the cost, how much did it cost the baker to make all the donuts?

210.

200.

190.

180.

170.

The best answer is B.

If on each donut he made a profit of 8% than he made the same profit on all of his donuts.

That means that 216 pounds are 108% of the cost, and 100% is 200 pounds.

The average age of Eric and George is 10 years smaller than the average age of Martha and Bella. If Martha is six years older than Eric, how much older is Bella from George?

- 2.
- 8.
- 10.
- 12.
- 14.

The best answer is E.

Write the equation:  $(Eric + George)/2 - 10 = (Bella + Martha)/2 \rightarrow$

$Eric + George + 20 = Bella + Martha,$

The girls are 20 years older than the boys, if one is older only by 6 than the other one has to be older by 14.

The grade point average of the entire class is 90. If the average of one third of the class is 96, what is the average of the rest?

- 92.
- 88.
- 89.
- 86.
- 87.

The best answer is B.

Choose a representative number of students, 3 for example.

Use the average formula:  $(96 + 2X)/3 = 90 \rightarrow 2X = 174 \rightarrow X = 87.$

In a workshop there are 4 kinds of beds, 3 kinds of closets, 2 kinds of shelves and 7 kinds of chairs. In how many ways can a person decorate his room if he wants to buy in the workshop one shelf, one bed and one of the following: a chair or a closet?

- 168.
- 16.
- 80.
- 48.
- 56.

The best answer is C.

You must multiply your options to every item.  $(2 \text{ shelves}) \times (4 \text{ beds}) \times (3 \text{ closets} + 7 \text{ chairs}) = 80$  possibilities.

In how many combinations can we choose 2 students out of 10 if each student is needed to fill a different roll in the student's council?

- 110.
- 45.
- 55.
- 90.
- 100.

The best answer is C.

For the first roll there are 10 free students, for the second roll there are only 9 left. Therefore we have  $(10 \times 9)$  90 combinations total.

Three people are to be seated on a bench. How many different sitting arrangements are possible if Erik must sit next to Joe?

- 2.
- 4.
- 6.
- 8.
- 10.

The best answer is B.

Treat the two who must sit together as one person. You have two possible sitting arrangements. Then remember that the two that sit together can switch places. So you have two times two arrangements and a total of four.

How many 3-digit numbers satisfy the following conditions: The first digit is different from zero and the other digits are all different from each other?

- 648.

- 504.
- 576.
- 810.
- 672.

The best answer is C.

For the first digit you have 9 options (from 1 to 9 with out 0), for the second number you have 9 options as well (0 to 9 minus the first digit that was already used) and for the third digit you have 8 options left.

So the number of possibilities is  $9 \times 9 \times 8 = 648$ .

Barbara has 8 shirts and 9 pants. How many clothing combinations does Barbara have, if she doesn't wear 2 specific shirts with 3 specific pants?

- 41.
- 66.
- 36.
- 70.
- 56.

The best answer is D.

There are  $(8 \times 9) 72$  possibilities of shirts + pants.  $(2 \times 3) 6$  Of the combinations are not allowed. Therefore, only  $(72 - 6) 66$  combinations are possible.

A credit card number has 6 digits (between 1 to 9). The first two digits are 12 in that order, the third digit is bigger than 6, the forth is divisible by 3 and the fifth digit is 3 times the sixth. How many different credit card numbers exist?

- 27.
- 36.
- 72.
- 112.
- 422.

The best answer is B.

First digit is 1, the second is 2, the third can be (7,8,9), the forth can be (0,3,6,9), the fifth and the sixth are dependent with one another. The fifth one is 3 times bigger than the sixth one, therefore there are only 3 options there: (1,3), (2,6), (3,9).

All together there are:  $1 \times 1 \times 3 \times 4 \times 3 = 36$  options.

In jar A there are 3 white balls and 2 green ones, in jar B there is one white ball and three green ones. A jar is randomly picked, what is the probability of picking up a white ball out of jar A?

- 2/5.
- 3/5.
- 3/10.
- 3/4
- 2/3.

The best answer is C.

The probability of picking the first jar is  $\frac{1}{2}$ , the probability of picking up a white ball out of jar A

is  $\frac{3}{3+2} = \frac{3}{5}$ . The probability of both events is  $\frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$ .

Out of a box that contains 4 black and 6 white mice, three are randomly chosen. What is the probability that all three will be black?

- 8/125.
- 1/30.
- 2/5.
- 1/720.
- 3/10.

The best answer is B.

The probability for the first one to be black is:  $\frac{4}{4+6} = \frac{2}{5}$ .

The probability for the second one to be black is:  $\frac{3}{3+6} = \frac{1}{3}$ .

The probability for the third one to be black is:  $\frac{2}{2+6} = \frac{1}{4}$ .

The probability for all three events is  $(\frac{2}{5}) \times (\frac{1}{3}) \times (\frac{1}{4}) = \frac{1}{30}$ .

The probability of pulling a black ball out of a glass jar is  $\frac{1}{X}$ . The probability of pulling a black ball out of a glass jar and breaking the jar is  $\frac{1}{Y}$ . What is the probability of breaking the jar?

- $\frac{1}{(XY)}$ .
- $\frac{X}{Y}$ .
- $\frac{Y}{X}$ .
- $\frac{1}{(X+Y)}$ .
- $\frac{1}{(X-Y)}$ .

The best answer is B.

Let  $Z$  be the probability of breaking the jar, therefore the probability of both events happening is  $Z \times (1/X) = (1/Y)$ .  $Z = X/Y$ .

An ant walks an average of 500 meters in 12 minutes. A beetle walks 15% less distance at the same time on the average. Assuming the beetle walks at her regular rate, what is its speed in km/h?

- 2.215.
- 2.5.
- 2.775.
- 3.2.
- 3.5.

The best answer is A.

A beetle moves  $(0.85 \times 500 = 425$  meters) in 12 minutes  $\rightarrow$  that is equal to 0.425 Km in  $1/5$  of an hour. The speed in the right units is  $0.425 \times 5 = 2.125$  Km/h.

A car was driving at 60 Km/h for 20 minutes, and then at 90Km/h for another 40 minutes. What was its average speed?

- 80.
- 75.
- 70.
- 65.
- 54.

The best answer is A.

The average speed is equal to:  $(\text{Total distance})/(\text{Total time}) = (60 \times 1/3 + 90 \times 2/3)/1 = 80$  Km/h.

The distance from Steve's house to work is 30 Km. On the way back Steve drives twice as fast as he did on the way to work. Altogether, Steve is spending 6 hours a day on the roads. What is Steve's speed on the way back from work?

- 10.
- 20.
- 5.

- 14.
- 15.

The best answer is E.

Steve's speed on the way back is double the speed to work therefore it takes him half the time to return home ---> Divide 6 hours by 1:2 ratio, the time it takes him to get home is 2 hours and the time driving to work is 4 hours. 30 Km in 2 hours is 15 Km per hour.

The running speed of a horse is three times faster than the jogging of a donkey.

If a horse is running for 4 hours and a donkey is jogging for 3 hours, what is the horse's speed (in Km/h) if the sum of their distances is 45 Km?

- 15.
- 9.
- 3.
- 12.
- 8.

The best answer is B.

X is the donkey's speed and 3X is the horse's speed. The total amount of distance is Equal to 45 and to  $3X \times 4 + X \times 3 = 15X$  --->  $X = 3$ , the speed of a horse is 9.

Two ants are moving from their farms towards each other. Ant A is moving at a speed of 9 Cm per hour and ant B is moving at a speed of 6 Cm per hour. If the farms are 60 Cm away from each other, what will be the distance ant A travels until meeting ant B?

- 18.
- 24.
- 36.
- 42.
- 48.

The best answer is C

The ants are moving towards each other, therefore adding their speeds will represent the speed that they are moving towards one another.  $60 \text{ Cm} / (9 + 6) = 4$  hours.

The distance that ant A will travel in 4 hours is  $4 \times 9 = 36 \text{ Cm}$ .

At 12:10 o'clock Bill leaves point A towards point B at a speed of 30 Km/h.  
At 13:40 o'clock Richi leaves from the same point towards point B also, but  
at a speed of 60 Km/h. At what time will Richi passes over Bill?

- 14:40.
- 15:10.
- 16:10.
- 15:40.
- 15:30.

The best answer is B.

At 13:40, Bill has already moved  $(30 \times 1.5)$  45 Km.

Their relative speed is  $(60 - 30)$  30 Km/h; therefore it would take  $(45 / 30)$   
1.5 hours to close the gap between the two. 13:40 + 90 minutes are 15:10.

From the starting point in a boat race, one opponent started to sail north at a  
speed of 1.6 Km/h, the other opponent started to sail west at a speed of 1.2  
Km/h. What is the distance in Km between the two competitors after 5  
hours?

- 10.
- 12.
- 12.5.
- 14.
- 15.4.

The best answer is A.

One is going north and the other is going west, therefore the distance should  
be calculated using the Pythagorean theorem. The one made a distance of  
 $1.6 \times 5 = 8$  Km, The second one did  $1.2 \times 5 = 6$  Km.

The distance between them is the square root of  $(64 + 36) = 10$  Km.

James can eat 25 marshmallows in 20 minutes. Dylan can eat 25 in one hour.

In how much time will the two eat 150 marshmallows?

- 40 minutes.
- 1 hour and 30 minutes.
- 1 hour.
- 1 hour and 40 minutes.
- 2 hours and 15 minutes.

The best answer is C.

Calculate each of their output in one hour: James can eat 75 and Dylan can eat only 25.

Together they can eat 100 marshmallows in 1 hour. It would take them 1.5 hours to eat 150 marshmallows.

A wolf eats 5.5 Kg of meat in 2 days. A baby tiger eats 3 Kg of meat in 4 days.

How much meat can the two combined eat in three days?

- 10.
- 8.
- 9.
- 7.
- 6.

The best answer is C.

A wolf eats 2.25 Kg a day; a baby tiger eats 0.75 Kg a day. Together they eat 3 Kg of meat every day, in three days they will eat 9 Kg of meat.

Two grandfathers can knit a sweater in 6 days. Two grandfathers and one grandmother can knit a sweater in 3 days. How many days will it take the grandmother to knit a sweater all by her self?

- 4.5.
- 5.
- 5.5.
- 6.
- 6.5.

The best answer is D.

Two grandfathers and a grandmother can knit a sweater in 3 days, therefore they can knit 2 sweaters in 6 days. Because two grandfathers can knit 1 in 6 days then the other sweater is done by the grandmother, she can knit 1 sweater in 6 days.

20 beavers, working together in a constant pace, can build a dam in 3 hours. How many hours will it take 12 beavers that work at the same pace, to build the same dam?

- 5.
- 2.
- 8.
- 4.
- 6.

The best answer is A.

20 beavers worked 3 hours; therefore 60 hours of work were needed to build the dam.  $60 \text{ hours} / 12 \text{ beavers} = 5 \text{ hours}$  of work to complete the same dam.

B and A are consecutive numbers. If  $A + B + X = 15$  then what is true about X?

- It can be equally divided by 5.
- It can be equally divided by 3.
- Positive.
- Even.
- Odd.

The best answer is D.

$A + B$  is an odd number; in order for the sum to be equal to 15 X must be an even number.

A and B are numbers between 0 and 9. When multiplying 56 by another number the result is 1AB. which of the following can represent A?

- 8.
- 2.
- 6.
- 4.
- 5.

The best answer is C.

We have two choices:  $56 \times 2 = 112$  or  $56 \times 3 = 168$ .

Therefore A could be 1 or 6. The answer is  $A = 6$ .

Q and R are numbers between 0 and 9. When multiplying 71 by another double-digit number the result is 7PQ. Which of the following could represent Q?

- 1.
- 8.
- 3.
- 5.
- 4.

The best answer is A.

We have two choices:  $71 \times 10 = 710$  or  $71 \times 11 = 781$ .

Therefore Q can be 0 or 1. The answer is A.

A and B are numbers between 1 and 9. What is  $ABAB/AB$ ?  
(AB is a two-digit number and ABAB is a 4-digit number).

- 11
- BAB
- 101
- AB
- 100.

The best answer is C.

Plug in numbers:  $A = 1, B = 2 \rightarrow AB = 12,$   
 $ABAB = 1212. 1212/12 = 101.$

V, W, X, Y and Z are numbers between 0 and 9.

If  $XYZ / 15 = WV$  and  $V-W=X$  ( $WV$  is a 2 digit number,  $XYZ$  is a 3 digit number), which of the following numbers can represent  $XYZ$ ?

- 321
- 215
- 633
- 570
- 414

The best answer is D.

We see that  $XYZ$  should be equally dividable by 15, or by 5 and 3.  
The only number that fits those conditions is 570.

A, B and C are different numbers, each between 0 and 9.

If  $B = C+2$ , what is  $BCA - CBA$ ? ( $CBA$  and  $BCA$  are both 3 digit numbers).

- 170
- 180
- 173
- 198
- 146

The best answer is B.

Lets put in some numbers.  $C = 1$ , so  $B = 1 + 2 = 3$ . There is no information about A so we'll leave it as A.

$BCA - CBA = 31A - 13A = 180$ . B is the answer.

Danny, Doris and Dolly flipped a coin 5 times and each time the coin landed on “heads”. Dolly bet that on the sixth time the coin will land on “tails”, what is the probability that she’s right?

- 1.
- $\frac{1}{2}$ .
- $\frac{3}{4}$ .
- $\frac{1}{4}$ .
- $\frac{1}{3}$ .

The best answer is B.

The probability of the coin is independent on its previous outcomes and therefore the probability for “head” or “tail” is always  $\frac{1}{2}$ .

In a deck of cards there are 52 cards numbered from 1 to 13. There are 4 cards of each number in the deck. If you insert 12 more cards with the number 10 on them and you shuffle the deck really good, what is the probability to pull out a card with a number 10 on it?

- $\frac{1}{4}$ .
- $\frac{4}{17}$ .
- $\frac{5}{29}$ .
- $\frac{4}{13}$ .
- $\frac{1}{3}$ .

The best answer is A.

The total number of cards in the new deck is  $12 + 52 = 64$ .

There are  $(4 + 12 = 16)$  cards with the number 10.

The probability of drawing a 10 numbered card is  $\frac{16}{64} = \frac{1}{4}$ .

There are 18 balls in a jar. You take out 3 blue balls without putting them back inside, and now the probability of pulling out a blue ball is  $\frac{1}{5}$ . How many blue balls were there in the beginning?

- 9.
- 8.
- 7.

12.  
6.

The best answer is E.

After taking out 3 balls there are 15 left.  $15/5 = 3$  blue balls is the number of left after we took out 3 therefore there were 6 in the beginning.

In a box there are  $A$  green balls,  $3A + 6$  red balls and 2 yellow ones. If there are no other colors, what is the probability of taking out a green or a yellow ball?

- $1/5$ .  
 $1/2$ .  
 $1/3$ .  
 $1/4$ .  
 $2/3$ .

The best answer is D.

The number of green and yellow balls in the box is  $A+2$ .

The total number of balls is  $4A + 8$ .

The probability of taking out a green or a yellow ball is  $(A+2)/(4A+8)=1/4$ .

The probability of Sam passing the exam is  $1/4$ . The probability of Sam passing the exam and Michael passing the driving test is  $1/6$ . What is the probability of Michael passing his driving test?

- $1/24$ .  
 $1/2$ .  
 $1/3$ .  
 $2/3$ .  
 $2/5$

The best answer is D.

Indicate  $A$  as the probability of Michael passing the driving test.

The probability of Sam passing the test is  $1/4$ , the probability of both events happening together is  $1/6$  so:  $1/4 \times A = 1/6$  therefore  $A = 2/3$ .

In a blue jar there are red, white and green balls. The probability of drawing a red ball is  $\frac{1}{5}$ . The probability of drawing a red ball, returning it, and then drawing a white ball is  $\frac{1}{10}$ . What is the probability of drawing a white ball?

$\frac{1}{5}$ .

$\frac{1}{2}$ .

$\frac{1}{3}$ .

$\frac{3}{10}$ .

$\frac{1}{4}$ .

The best answer is B.

Indicate A as the probability of drawing a white ball from the jar.

The probability of drawing a red ball is  $\frac{1}{5}$ .

The probability of drawing both events is  $\frac{1}{10}$  so,  $\frac{1}{5} \times A = \frac{1}{10}$ .

Therefore  $A = \frac{1}{2}$ .

Out of a classroom of 6 boys and 4 girls the teacher picks a president for the student board, a vice president and a secretary. What is the probability that only girls will be elected?

$\frac{8}{125}$ .

$\frac{2}{5}$ .

$\frac{1}{30}$ .

$\frac{1}{720}$ .

$\frac{13}{48}$ .

The best answer is C.

The basic principle of this question is that one person can't be elected to more than one part, therefore when picking a person for a job the "inventory" of remaining people is growing smaller.

The probability of picking a girl for the first job is  $\frac{4}{10} = \frac{2}{5}$ .

The probability of picking a girl for the second job is  $\frac{(4-1)}{(10-1)} = \frac{3}{9}$ .

The probability of picking a girl for the third job is  $\frac{(3-1)}{(9-1)} = \frac{1}{4}$ .

The probability of all three events happening is:  $\frac{2}{5} \times \frac{3}{9} \times \frac{1}{4} = \frac{1}{30}$ .

Two dice are rolled. What is the probability the sum will be greater than 10?

- 1/9.
- 1/12.
- 5/36.
- 1/6.
- 1/5.

The best answer is B.

When rolling two dice, there are 36 possible pairs of results ( $6 \times 6$ ).

A sum greater than 10 can only be achieved with the following combinations: (6,6), (5,6), (6,5).

Therefore the probability is  $3/36 = 1/12$ .

The probability of having a girl is identical to the probability of having a boy. In a family with three children, what is the probability that all the children are of the same gender?

- 1/8.
- 1/6.
- 1/3.
- 1/5.
- $1/4$ .

The best answer is E.

The gender of the first-born is insignificant since we want all children to be of the same gender no matter if they are all boys or girls.

The probability for the second child to be of the same gender as the first is:  $1/2$ . The same probability goes for the third child. Therefore the answer is  $1/2 \times 1/2 = 1/4$ .

On one side of a coin there is the number 0 and on the other side the number 1. What is the probability that the sum of three coin tosses will be 2?

- 1/8.

- 1/2.
- 1/5.
- 3/8.
- 1/3.

The best answer is D.

The coin is tossed three times therefore there are 8 possible outcomes ( $2 \times 2 \times 2$ ). We are interested only in the three following outcomes: (0,1,1), (1,0,1), (1,1,0).

The probability requested is  $3/8$ .

The average length of 6 snakes is 80 cm. If the average length of one third of the snakes is 70 cm, what is the average of the other snakes?

- 75.
- 85.
- 90.
- 100.
- 94.

The best answer is B.

The length of all six snakes is  $6 \times 80 = 480$  cm.

Third of the snakes are by average 70 cm long therefore their sum is 140.

The sum of the length for the remainder of the snakes is  $480 - 140 = 340$ .

$340 / 4$  snakes is 85 cm.

There are ten players in the basketball team. If the average height of the players is 170 cm, what will be the new average height if a 192 cm player will join the team?

- 181.
- 172.2.
- 172.
- 168.
- 184.

The best answer is C.

The new player is  $(192 - 170 = 22 \text{ cm})$  above average. Dividing the extra height among 11 players is 2 cm per player, thus the new average height is  $(170 + 2 = 172 \text{ cm})$ .

The grade point average of one third of the classroom is 69; the grade point average of the rest is 60. What is the grade point average of the whole class?

61.

63.

65.

67.

It depends how many people are there in the class.

The best answer is B.

Because the number of people in the classroom is unknown, take 3.

One person has 69 and the rest have 60. Their sum is 189.

$189/3$  students is 63.

In the Hillside summer camp there are 50 children. 90% of the children are boys and the rest are girls. The camp administrator decided to make the number of girls only 5% of the total number of children in the camp. How many more boys must she bring to make that happen?

50.

45.

30.

40.

25.

The best answer is A.

The total number of girls in the camp is  $(0.1 \times 50 = 5)$ . In order for 5 girls to be 5% there has to be a total number of 100 kids in the camp therefore the camp's administrator should bring 50 more boys.

Kelly used to get a 30% discount on movie tickets. When the price of a movie ticket increased by 50%, she still got the same dollar amount of discount. What is the percent of discount Kelly got of the new Ticket price?

- 10%
- 20%
- 25%
- 35%
- 38%

The best answer is B.

The price of the ticket is unknown. Take 100 as an example.

30% discount of 100 is \$30, that amount remained the same after the price of a ticket grew by 50%.

The new price of a ticket is \$150, so  $30/150$  is 20%.

A and B are numbers between 1 and 9. If  $A = 4B$  than by what number is the two digit number BA not divisible?

- 1
- 2
- 7
- 14
- 3

The best answer is C.

You have two choices: 1)  $4 = 4 \times 1$  2)  $8 = 4 \times 2$ .

In the first choice, (BA = 14) can be divided by all the numbers except 3. In the second choice, (BA = 28) can be divided by all the numbers except 3. Therefore, E is the answer.

If X percent of 2.5X are 3X, then X could be?

- 90.
- 120.

150.  
170.  
180.

The best answer is B.

X percent is  $X/100$ .

X percent of  $2.5X$  is  $(X/100)(2.5X) = (X/100)(5X/2) = 3X \rightarrow$  divide both sides by  $X$ .

$(X/40) = 3 \rightarrow X = 120$ .

Gina and Tina's average grade is 23 points higher than Tina's grade.  
What is the difference between their grades?

- 23.
- 46.
- 16.
- 11.5.
- 15.

The best answer is B.

Define T as Tina's grade and G as Gina's grade.

Write the equation,  $T + 23 = (G + T)/2 \rightarrow 2T + 46 = G + T \rightarrow T + 46 = G \rightarrow G - T = 46$ .

If Z is a positive integer and  $(192)^5$  is a multiple of  $8^Z$ , what is the largest possible value of Z?

- 5.
- 7.
- 8.
- 10.
- 12.

The best answer is D.

Factorize  $(192)^5$  and see what can be the largest value of Z.

$192 = 64 \times 3 = 8 \times 8 \times 3 \rightarrow (192)^5 = (8 \times 8 \times 3)^5 = 3^5 \times 8^{10}$ .

The largest possible value of  $8^Z$  which is a factor of  $(192)^5$  is the largest possible value of Z of which  $8^Z$  is a factor of  $8^{10}$ .  $Z = 10$ .

If  $X$  is a positive integer and  $(405)^4$  is a multiple of  $3^X$ , what is the largest possible value of  $X$ ?

- 5.
- 12.
- 16.
- 20.
- 26.

The best answer is C.

Find the factors of  $(405)^4$  and see what the largest value of  $X$  can be.  
 $405 = 81 \times 5 = 9 \times 9 \times 5 = 3 \times 3 \times 3 \times 3 \times 5 \rightarrow (405)^4 = (3 \times 3 \times 3 \times 3 \times 5)^4 = 3^{16} \times 5^4$ .

The largest possible value of  $3^X$  that is still a factor of  $(405)^4$  is the largest possible value of  $X$  and that is  $3^{16}$ .  $X = 16$ .

The flying acrobatic team is made up of 120 airplanes. The team wants to form a rectangular formation with  $X$  planes in a row and  $Y$  planes in a column. If the number of airplanes in a row is no less than 4 and no more than 30, how many different combinations of rectangular shapes are possible?

- 4.
- 5.
- 6.
- 8.
- 10.

The best answer is D.

Use the factors of 120 are:  $1 \times 120$ ,  $2 \times 60$ ,  $3 \times 40$ ,  $10 \times 12$ ,  $4 \times 30$ ,  $5 \times 24$ ,  $6 \times 20$  and  $8 \times 15$ .

We are looking for combinations of (row x column) that are all between 8 and 30.

The possibilities are:  $8 \times 15$ ,  $15 \times 8$ ,  $4 \times 30$ ,  $30 \times 4$ ,  $5 \times 24$ ,  $24 \times 5$ ,  $10 \times 12$  and  $12 \times 10$ . 8 possibilities total.

What is the perimeter of a rectangle having an area of 60?

(1) The length and width of the rectangle are even integers smaller than 25.

(2) The length of the rectangle is larger than three times the width.

The best answer is A.

The question tells you that the area is 60, the area of a rectangle is equal to length x width, in order to find the perimeter, one should find the value of the length and the value of the width.

Statement (1) tells us that both the length and the width are even integers and therefore we know their exact values because 60 can be factorized to:  $1 \times 60$ ,  $2 \times 30$ ,  $3 \times 20$ ,  $4 \times 15$ ,  $5 \times 12$  and  $6 \times 10$ .

The only even integers smaller than 25 are  $(6 \times 10)$  and we know the perimeter.

The perimeter of a rectangle is 136, what is the area of the rectangle?

The length is more than twice the width.

The length and width are both prime numbers larger than 30.

The best answer is B.

Define L as the length and W as the width.

$2L + 2W = 136 \rightarrow L + W = 68$ . We need one more equation in order to find the area.

Statement (1) does not give you exact values and therefore it's not sufficient.

Statement (2) tells us that both L and W are prime numbers larger than 30, using the equation in the question; the only option to get 68 is with 31 and 37. This statement is sufficient; the area is  $31 \times 37$ .

Which of the following is the greatest possible common divisor of two different positive integers, both smaller than 124?

- 123.
- 122.
- 63.
- 62.
- 61.

The best answer is 61.

A divisor is actually a factor of a number.

Check each of the answers individually:

124 is divisor of itself, but obviously he has no other divisors smaller than 124.

63 is a divisor of itself and 126, which is bigger than 124.

62 is on the limit, we were asked for divisors less than 124.

This is the right answer. 61 is a divisor of 61 and 122.

X is a positive integer, is X even?

(1)  $9X^2$  is divisible by 4.

(2)  $3X + 2$  is divisible by 8.

The best answer is D.

We are to find if X is an even number.

Statement (1) tells us that  $9X^2$  is an even number (it's divisible by 4) and therefore  $X^2$  must be an even number. An odd number squared is also odd and therefore X must be even, this statement is sufficient.

Statement (2) tells us that  $3X + 2$  is an even number (it's divisible by 8).

If you subtract 2 from  $(3X+2)$  the result will still be even. If  $3X$  is even then X must be even. This statement is also sufficient to answer the question.

M is a positive integer, is M odd?

$2M^3 + 2M$  is divisible by 8.

$M + 10$  is divisible by 10.

The best answer is D.

We are being asked if  $M$  is an odd number.

Statement (1) tells us that  $2M^3 + 2M$  is divisible by 8 and so  $M^4 + M$  is divisible by 4 and is even. We have two choices:  $M^3$  and  $M$  are either odd or even. This statement is insufficient.

Statement (2) is sufficient, if  $M + 10$  is divisible by 10 then  $M + 10$  is an even number. This statement is sufficient and the answer is D.

How many of the positive divisors of 120 are also multiples of 4 not including 120?

- 3.
- 4.
- 5.
- 7.
- 8.

The best answer is D.

Write down all the factors of 120: 60, 40, 30, 24, 20, 15, 12, 10, 8, 6, 5, 4, 3, 2, 1.

Among these numbers only the following are multiples of 4: 4, 8, 12, 20, 24, 40 and 60.

What is the sum of squares of the first two positive odd integers if the sum of squares of the first two positive even integers is  $X$ ?

- X.
- $X/3$ .
- $X/2$ .
- $X/6$ .
- $3X/4$ .

The best answer is C.

The squares of the first two odd numbers are:  $1^2 + 3^2 = 10$ .

The squares of the first two even numbers are:  $2^2 + 4^2 = 20$ .

A carousel spins at a rate of  $\frac{1}{2}$  a round per second. If a point on its circumference is located 0.5 meters from the center of rotation, how many times approximately will this point reach its starting point in two minutes?

- 25.
- 30.
- 60.
- 120.
- 180.

The best answer is C.

If the carousel spins half a turn in one second then it spins once every two seconds. In two minutes there are 120 seconds and therefore the point will reach its starting point ( $120 / 2 = 60$ ) times, no matter how far it is from the center of the circle.

There are 7 players in a bowling team with an average weight of 85 Kg. If two new players join the team, one weighs 110 Kg and the second weighs 60 Kg, what will be the new average weight?

- 75 Kg.
- 80 Kg.
- 85 Kg.
- 90 Kg.
- 92 Kg.

The best answer is C.

The trick to this question is to notice that the average weight of the two new players is exactly 85 Kg and so when they join the team, the average weight stays the same.

If 10% of the employees of the state fare are police officers, what is the number of employees who are not police officers?

- (1) 5% of the police officers employed in the fare are woman.
- (2) 45% of the employees at the state fare are woman.

The best answer is E.

In order to know how many people aren't officers you need a fix value, in other words you need to translate percentage into real values.

Statement (1) doesn't give any real numbers and therefore it's not sufficient.

Statement (2) is the same as one in that matter, if we wanted to know the percentage of the woman officers, the statements would have been satisfying. More data is required.

If 90% of the people in Rich-Town read the Rich-Town magazin how many people read the Rich-Town news bulletin?

- (1) There are one thousand residents in Rich-Town.
- (2) 10% of the people reading the Rich-Town magazin also read the Rich-Town news bulletin.

The best answer is E.

No statement here tells us that all people read any magazin at all, moreover no staement gives any data regarding the News bulletin readers that do not read the Ric-Town magazin. More data is needed to solve this question.

If  $Y = 2X - 10$ , what is the value of  $Z$ ?

- (1)  $Z = Y + 2X$ .

$$(2) X = Z - Y.$$

The best answer is C.

The question presents to us one equation with two unknowns and asks about evaluating a third.

We need two more different equations.

Statement (1) and statement (2) are both independent and so combining them is sufficient.

If  $Q = W + 22$ , what is the value of  $(Q + W)$ ?

$$(1) Q = -86 - W.$$

$$(2) W = 2Q + 10.$$

The best answer is D.

We are given an equation with two unknowns and we are asked upon the sum  $(Q+W)$ .

Statement (1) is sufficient by itself with out even using the data in the question,  $Q + W = -86$ .

Statement (2) is also sufficient by itself, use the equation given in the question along with statement (2) to solve.

Each of the statements is sufficient by itself.

Is  $X$  greater than 1?

$$(1) X > X^2.$$

$$(2) -X < -X^2.$$

The best answer is D.

Statement (1) tells you that  $X$  is greater than  $X^2$ , that is true only if  $X$  is between zero and one and so the answer to the question is no.

Statement two is identical to one, multiply both sides by (-1) and don't forget to change the sign of the inequality.  
Either statement is sufficient by itself.

Is  $0 < Y < 1$ ?

(1)  $1/Y$  is positive.

(2)  $Y > Y^2$ .

The best answer is B.

From statement (1)  $Y$  can be 2 or  $1/2$  and therefore this statement is insufficient.

Statement (2) tells us that  $Y > Y^2$ . that is true only if  $Y$  is between zero and one. So, Statement (2) is sufficient.

Is the triangle ABC isosceles?

(1) Angle A is equal to the sum of angles B and C.

(2) Side AB is different from CB.

The best answer is E.

Draw a triangle.

From statement (1) we can conclude that angle A is 90 degrees because it is equal to half of the degrees in the triangle, this statement is not sufficient since the triangle can still be a non isosceles right triangle.

Statement (2) is also insufficient; all it tells us is that two sides are different from one another. More data is required.

Is the triangle ABC equilateral?

(1) Angle A is half the sum of angles B and C.

(2) AC is equal to AB.

The best answer is C.

Let angle A be X. The sum of the angles in triangle is equal to 180 degrees.

From statement (1) we can write:  $X + 2X = 180 \rightarrow X = 60$ .

The sum of the two other angles is equal to 120, but they're not necessarily equal and therefore this statement is not sufficient alone.

Statement (2) alone is insufficient, unless the question asked if ABC is an isosceles triangle.

Combine both statements; if one angle is equal to 60 and the triangle is isosceles then two of the angles must be equal to 60, the third must also be 60 and the triangle must be equilateral.

What is the sum of two angles in a triangle?

(1) One of the angles is equal to the sum of the other two.

(2) One of the sides is equal to the other.

The best answer is E.

Both statements together help us know that the triangle is isosceles.

We are asked upon two arbitrary angles and so we cannot determine what is their sum. More data is required.

The number of employees at the justice department tripled between 1994 and 1996. How many employees were in the department in 1994?

(1) The number of employees in 1996 is bigger by 12 than the number in 1994.

(2) In 1995 the number of employees was 12.

The best answer is A.

Define X as the number of employees in the year 1994 and Y as the number of employees in 1996.

From the question we can write that  $Y = 3X$ .

Statement (1) tells us that  $Y = X + 12$  and so we have two equations with two unknowns. This statement is sufficient by itself.

Statement (2) adds an unnecessary parameter to the equation and therefore its insufficient.

The water level in lake Victoria increased over the last week. By what percent did the level of water increase?

(1) There were 45 million liters of water in the lake last week.

(2) Water is constantly being pured into the lake at a rate of 2 million litters a day from a nearby stream.

The best answer is E.

We are to find the increase of the water in percent terms.

Statement (1) gives us the exact amount of water that was in the lake last week.

Statement (2) holds no data regarding water leaving the lake or other water being pured in.

What is the average (arithmetic mean) of X and Y?

(1)  $XY = 12$ .

(2)  $2X = 26 - 2Y$ .

The best answer is B.

Use the average formula: the average of X and Y is  $(X+Y)/2$ .

Statement (1) gives us the value of XY and not (X+Y) and is therefore insufficient.

Statement (2) can be simplified to:  $2X + 2Y = 26 \rightarrow (X+Y) = 13$ . This statement is sufficient by itself.

What is the value of  $XY$ ?

(1)  $X^2 - 2X + 1 = 0$ .

(2)  $Y^2 + 8Y + 16 = 0$ .

The best answer is C.

Statement (1) can also be written as  $(X - 1)^2$  and therefore  $X = 1$ .

Statement (2) can also be written as  $(Y + 4)^2$  and therefore  $Y = -4$ .

Using both statements together, we know the value of  $X$  and  $Y$  and so we can calculate  $XY$ .

What is the value of  $(X + Y)$ ?

(1)  $X^2 - 4X + 4 = 0$ .

(2)  $Y^2 + 6Y + 8 = 0$ .

The best answer is E.

Statement (1) can also be written as  $(X - 2)^2$  and therefore  $X = 2$ .

Statement (2) can also be written as  $(Y + 4)(Y + 2)$  and therefore the value of  $Y$  is not distinct.

$(X + Y)$  can have two different values, and therefore more data is required.

At the Rocket propulsion center, hybrid missiles are being tested 4 times a day and scramjet missiles are being tested 6 times a day. If at a certain day 186 tests were held, what is the difference between the numbers of hybrid missiles to scramjet missiles that were tested?

(1) There are 37 missiles total in the Rocket propulsion center.

(2) There are 19 scramjet missiles in the Rocket propulsion center.

The best answer is D.

Define H as the number of hybrid missiles and S as the number of scramjet missiles.

The question lets us set up the equation:  $4H + 6S = 186$ .

We need one more equation in order to answer the required question.

Statement (1) can be written as  $H + S = 37$ .

Statement (2) can be written as  $S = 19$ .

Either statement by itself is sufficient because it presents us with a second equation.

If red buckets can be filled with 0.5 liters of sand and blue buckets can be filled with 0.8 liters of sand, how many buckets were filled?

(1) The buckets were filled with 8 liters of sand total.

(2) Three more red buckets than blue were filled with sand.

The best answer is C.

Define R as the number of red buckets and B as the number of blue ones.

From the question and statement (1) we can write the following equation:

$0.5R + 0.8B = 8$ . This equation has three different solutions: (0 red and 10 blue), (0 blue and 16 red), and (5 blue and 8 red). Since it is possible to have no red or no blue buckets, all three solutions apply and there is not enough information.

From statement (2) we can write the following equation:  $R = B + 3$ .

Combining both statements will result in two equations with two unknowns, so we can solve the question. And get the third solution only.

In order to pass the Bar exam, one should answer 65% of the answers correctly. Did Kevin pass the Bar exam?

(1) Kevin made a mistake on less than 40% of the questions.

(2) Kevin answered twice as many correct answers as wrong ones.

The best answer is B.

From statement (1) we can conclude that the number of correct answers is more than 60%. This statement isn't sufficient on its own because we don't know if Kevin answered more or less than 65%. Statement (2) is

sufficient, it tells us that two third (66.7%) of the questions were correct and therefore Kevin passed the test.

On an IQ exam, each correct answer grants the examinee with 3 points but every wrong answer deducts 1 points. How much did Ernst get on the IQ exam?

- (1) There are 50 questions in the IQ exam.
- (2) The ratio between the right answers and the wrong answers that Ernst answered is 9 to 1.

The best answer is C.

Define C as the number of correct answers and W as the number of wrong answers.

Statement (1) tells us that  $C + W = 50$ .

Statement (2) tells us that  $(50 / (9+1) = 5)$  is the number of wrong answers and so 45 is the number of right ones. Using the numbers presented in the question we can answer the question of how much Ernst got. Thus, Statement (1) and (2) combined are sufficient.

Is A a multiple of B?

- (1) B is a multiple of A.
- (2) 2A is a multiple of B.

The best answer is E.

Rephrase the question: is  $A/B$  an integer?

Statement (1) can be written as:  $B/A$  is an integer. Take  $A = 5, b = 10$ :  $B/A$  is an integer but  $A/B$  isn't.

Take  $A=B=4$ ,  $A/B = B/A$  and they are both integers and therefore this statement is insufficient.

Statement (2) can be written as  $2A/B$  is an integer. Take  $A=10, B=20$ :  $2A/B$  is an integer but  $A/B$  isn't.

Take  $A=B=1$ :  $2A/B$  is an integer and also  $A/B$  is an integer and therefore this statement is also insufficient.

If A and B are two different two-digit numbers, is  $(A + B)/2$  an integer?

(1) AB is an odd number.

(2)  $(B - A)$  is an even number.

The best answer is D.

We are required to find if the sum of A and B is an even number.

Statement (1) tells us that AB is odd. The multiplications of two odd numbers only will give an odd number and so A and B are both odd numbers and therefore their sum is an even number. This statement is sufficient by itself.

Statement (2) is also sufficient, if the difference between two numbers is even then the numbers can either be both odds or both even. In any of the cases, their sum is even.

Tom divided his cards between Tim and Din so each one received an equal odd amount of cards. The number of cards that Tim received multiplied by the number of cards that Din received is a number larger than 49 and smaller than 121. How many cards did Tom have in the first place?

16.

22.

18.

14.

32.

The best answer is C.

Answers A and E are disqualified immediately because those are even numbers that cannot be divided into two odd numbers. 22 is  $11 + 11$  but

$11 \times 11$  is 121. The same goes with  $14 = 7 \times 7 = 49$ . Therefore, the answer is 18.  $18 = 9 + 9$ .  $9 \times 9 = 81$ .

The number of hats that Sarah owns is 5 times bigger than the number Nicky owns. If Sarah gives 6 hats to Nicky, they will have the same number of hats. How many hats does Sharon own now?

- 5.
- 2.
- 3.
- 4.
- 6.

The best answer is C.

Let  $X$  be the number of hats that Nicky owns, Sarah owns  $5X$ .

$$5X - 6 = X + 6 \rightarrow X = 3.$$

Jason washes 3 plates after each and every diner. After how many dinners will Jason wash the 26th plate?

- 10.
- 9.
- 8.
- 7.
- 6.

The best answer is B.

Only after he finishes each dinner he washes three plates. So after his 8'Th dinner he'll finish the 24'Th plate and only after the 9'Th dinner he'll wash plates number 25, 26 and 27.

Arnold and Danny are two twin brothers that are celebrating their birthday. The product of their ages today is smaller by 9 from the product of their ages a year from today. What is their age today?

- 7.
- 2.
- 9.
- 4.
- 5.

The best answer is D.

Back solve using the answers. Take the age 4.

$4 \times 4 = 16$ .  $16 + 9 = 25$ . And in one year they'll be 5 so  $5 \times 5 = 25$ .

Brian got in his latest test a grade 3 times higher than he anticipated. In spite of that, he decided to appeal. After the appeal he got 30 points lower than the original grade but still the grade was 30 points higher than his anticipation. What was the grade Brian anticipated?

- 15.
- 20.
- 30.
- 25.
- 35.

The best answer is C.

The grade Brian anticipated is  $x$ . The grade that he really got was  $3x$ . After the appeal he got  $3x - 30$  that was still  $x + 30$ . Therefore  $x = 30$ .

Steve's monthly income is bigger by \$4,000 than John's salary. If they both earned (together) \$144,000 in one year, what is John's monthly income?

- \$1,000.
- \$2,000.
- \$3,000.
- \$4,000.
- \$5,000.

The best answer is D.

Steve every month:  $x + 4,000$ .

Steve and John together every month:  $x + x + 4,000 = 2x + 4,000$ .

Steve and John in a year:  $12(2x + 4,000) = 144,000 \rightarrow x = 4,000$ .

The value of a stock is  $X$  dollars. On Sunday the stock's value grew by half of its value, but on Monday its value dropped to a third of its new value. What is the stock's value at the end of Monday?

- X.
- X/2.
- 2X/3.
- X/3.
- X/4.

The best answer is B.

Lets say that the original value of the stock was 100.

After Sunday its value was 150, after Monday its value was 50 thus one half of its original value.

Heather has 35 stamps in her stamp collection. The stamps are divided into three groups: old, new and foreign. The number of stamps in the old group is one half of the number of stamps in the new group and one seventh of the total amount of stamps. How many foreign stamps does Heather have?

- 21.
- 20.
- 15.
- 7.
- 18.

The best answer is B.

If the number of old stamp is  $1/7$  of the total amount then there are 5 old stamps. Five old stamps are  $1/2$  of the new ones so there are 10 new stamps, therefore there are  $(35 - 10 - 5 = 20)$  foreign stamps.

The number of pizza slices that are sold in Joey's Pizza are only in quantities of 5 and 8 slices per customer. How many slices cannot be bought?

- 42.
- 33.
- 22.
- 20.
- 38.

The best answer is C.

Check every answer.

$$42 = 2 \times 5 + 8 \times 4.$$

$$33 = 5 \times 5 + 8.$$

$$20 = 4 \times 5.$$

$$38 = 5 \times 6 + 8.$$

The only a number which cannot be bought is 22.

In the beginning of the season, the owner of a football team bought T players for the price of 4R dollars each. At the end of the season the owner sold the players in a total profit of X. How many dollars did the owner get for all the players?

$$X - 4TR.$$

$$4X + 4TR.$$

$$4TR + X.$$

$$4(TR - X).$$

$$4TR - X.$$

The best answer is C.

The owner bought T player that cost him altogether 4TR.

He had a profit of X so he sold them for 4TR + X.

Elizabeth is interested in dividing the rooms in the house among the family. Unfortunately, they do not divide equally. It turns out that in order for the rooms to be dividable, Elizabeth has to build two more rooms and kick out one of the family members. Which of the following can describe the number of the initial rooms in the house and the initial number of family members (in the order Rooms, family)?

- 20; 8.
- 30; 9.
- 15; 6.
- 10; 5.
- 22; 10.

The best answer is B.

First we can eliminate answers where the number of rooms can be divided by the number of people, such as answer D.

We are looking for an answer that if you subtract 1 from the right and add 2 to the left, the left number will be divisible by the right number.

The only answer that fits this description is B.  $(30 + 2)/(8) = 4$ .

In a hair cut competition, the number of blonde girls is three times bigger than the number of brown haired girls, and the number of brown haired girls is twice the number of red haired girls. Assuming that there is no other hair color, what is the proportion of the brown haired girls?

- 2/3.
- 4/9.
- 1/3.
- 5/9.
- 2/9.

The best answer is E.

Pick a number for the red haired girls: 1.

The number of brown haired girls is twice as much, thus 2.

The number of blondes is three times as much, thus 6.

The total number of girls is 9 and the brown ones are 2 out of 9.

In store A there are 10 pairs of pants for every 40 store B has. The price ratio between the pants in store B and the pants in store A is 3:4. If all the pants were sold in both places until the stock ran out, what is the ratio between the total amount store A earned to the total amount store B earned?

- 3:16.
- 2:3.
- 1:3.
- 3:4.
- 2:5.

The best answer is C.

Plug in numbers. Pants in store A cost \$3 and in Store B \$4.

In Store A they sold 10 pairs so they earned \$40, in store B they earned (40 x 3) \$120. The ratio between the money earned is 1 to 3.

In a barrel of juice there is 30 liters; in a barrel of beer there are 80 liters. If the price ratio between a barrel of juice to a barrel of beer is 3:4, what is the price ratio between one liter of juice and one liter of beer?

- 3:2.
- 2:1.
- 3:1.
- 4:3.
- 3:4.

The best answer is B.

Pick numbers: a barrel of beer costs \$40 and a barrel of juice costs \$30 according to the given ratio. One liter of beer will cost \$0.5 and one liter of juice will cost \$1. Therefore the price ratio is 2:1.

Chris has 100 gold bars and 60 bronze bars. After replacing 10 gold bars with bronze bars, he had an equal amount of gold and bronze bars. The price ratio between a gold and a bronze bar is?

- 2:3.
- 1:2.
- 1:3.
- 3:4.
- 2:5.

The best answer is C.

After replacing 10 gold bars into bronze ones he had 90 of each thus 10 gold bars are worth 30 bronze ones, and this is their price ratio.

Car A travels at three times the average speed of car B. Car A started to travel at 12:00 o'clock, car B started to travel at 16:00 o'clock. What is the speed of car B (in Km/h) if the total distance that both cars traveled until 18:00 was 1000 Km?

- 10.
- 25.
- 30.
- 38.
- 50.

The best answer is E.

The speed of car B is X; the speed of car A is 3X.

Car A traveled  $3X \times 6 \text{ hours} = 18X \text{ Km}$ .

Car B traveled  $X \times 2 \text{ hours} = 2X \text{ Km}$ .

$1000 = 20X \rightarrow X = 50 \text{ Km/h}$ .

A bird is flying from an oak tree to a pine tree in a speed of 6 Km/h. On her way back, she flew at a speed of 4 Km/h and therefore the trip lasted 4 hours more. What is the distance between the trees (In Km)?

- 12.
- 24.
- 36.
- 48.

52.

The best answer is D.

The distance to the pine tree is  $6 \times X$ , where  $X$  represents the time of the trip. The distance back to the oak tree is  $4(X+4)$ , assuming the trip back is equal in length.

Therefore  $6X = 4(X+4) \rightarrow X = 8$ . The length of the trip is  $8 \times 6 = 48$  Km.

Liz drove from point A to point B at 40 Km/h. On her way back she drove at 50 Km/h and therefore her way back lasted one hour less. What is the distance (in Km) between A and B?

150.

200.

600.

450.

500.

The best answer is B.

The length of the road from A to B is  $40 \times X$ , where  $X$  is the time.

The road back is:  $50(X - 1)$ . The road is the same length so  $40X = 50(X - 1) \rightarrow X = 5$  hours. The distance is 200 Km.

The average speed of a Zebra is 4 times faster than that of a horse.

The Zebra started to run at 5:00 o'clock and the horse started two hours later. What is the Zebra's speed if the total distance that the two animals traveled until 10:00 o'clock is 46 Km?

11.5.

12.

16.

8.

6.5.

The best answer is D.

Let  $X$  be the horse's speed. The following equation came from the data:  $4X \times 5 + X \times 3 = 46 \rightarrow X = 2$  Km/h. The zebra's speed is 8 Km/h.

Two dung beetles start to run simultaneously towards each other when they're 150 feet apart. The first beetle runs at a speed of 20 feet per minute and the second beetle runs at a speed of 10 feet per minute. At the moment they start running towards each other a fly leaves the first beetle and flies towards the second one at a speed of 70 feet per minute, when he gets there he turns around and starts to fly towards the first beetle and so on. What is the total distance in feet, that the fly will travel until the beetles meet?

- 250.
- 200.
- 300.
- 350.
- 400.

The best answer is D.

The distance between the two beetles is 150 feet; they are running together at a speed of  $(10 + 20)$  30 feet per minute, therefore it will take them 5 minutes to meet. The fly flies at a speed of 70 feet per minute so he travels a total distance of  $5 \times 70 = 350$  feet.

If X and Y are both two-digit numbers, is XY an even number?

- (1) The sum of X and Y gives an even number.
- (2) The value of Y is three times the value of X.

The best answer is E.

Statement (1) isn't sufficient, X and Y can be both odd or both even, but their multiplication can be either one. Statement (2) tells us that  $Y = 3X$ , X and Y can both be even or odd from this statement and therefore this statement is also insufficient.

Both of the statements imply the same thing and so combining them will not help. More data is required.

Arthur and Bartholomew live in the same multi-story apartment building. How many stories does the building have?

- (1) There are 5 stories between the apartment of Arthur and Bartholomew.
- (2) There are 8 stories above Arthur's apartment and 8 stories below Bartholomew's apartment.

The best answer is E.

Define A as the Arthur's floor and B as Bartholomew's floor.

Using both statements, we don't know whether A is over B or the opposite and therefore we cannot determine the number of stories in the building.

If A is above B then: The number of stories is  $(5+8+8 = 21)$ .

If B is above A then: The number of stories is  $(5+3+3 = 11)$ .

Comp and Calc are two companies that are located on different floors in a skyscraper. How many floors does the skyscraper have?

- (1) There are 24 floors between Comp's floor and Calc's floor.
- (2) There are 32 floors above Comp's floor and 12 floors below Calc's floor.

The best answer is C.

Using both statements we know that Comp's floor is the higher one among the two because there are only 12 floors beneath Calc's floor and therefore it must be the lower one.

The number of floors in the building is  $(12 + 24 + 32 = 68)$ .

The combination of the two statements is sufficient.

What is the distance between Greentown to Bluetown?

- (1) The distance between Greentown and Redtown is 20 miles.

(2) The distance between Bluetown and Redtown is 5 miles.

The best answer is E.

Draw a guiding chart with three points on it.

Statement (1) tells us nothing about Bluetown and so it's insufficient.

Statement (2) tells us nothing about Greentown and so it's insufficient on its own.

Even after you combine both statements, you don't know if Redtown is between both cities or not.

The distance from Greentown to Bluetown can be 25 or 15 miles. More data is required.

How long does it take to drive from the factory to the warehouse?

(1) It takes 15 minutes to drive from the factory to the harbor.

(2) It takes 25 minutes to drive from the warehouse to the harbor.

The best answer is E.

From both statements we can't conclude where is the location of the harbor relative to the other two places, in other words, the harbor could be between the factory and the warehouse or it could be beyond the two. The distance between the factory and the warehouse can be between 10 and 40 miles.

Jasmine is the oldest member of the "Brain Storm club". If next year, the age of Sam will be two thirds that of Jasmine, what is Sam's age today?

(1) Rick is Sam's twin brother.

(2) Three years ago, Rick's age was half of that of Jasmine.

The best answer is C.

Define J as the age of Jasmine and S as the age of Sam.

The question tells us that in a year from now:  $(S + 1) = \frac{2}{3} \times (Y + 1)$ .

Statement (1) presents a new parameter, Rick's age, which is equal to Sam's age.

Statement (2) tells us that:  $(X - 3) = \frac{1}{2} \times (Y - 3)$ .

Using both statements, we have two equations with two unknowns.

X is a prime number. Is Y odd?

(1) X is divisible by 7.

(2) YX is an even number.

Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

Either statement BY ITSELF is sufficient to answer the question.

Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is C.

From statement one we conclude that  $X=7$  because it's the only prime number that can be divided by 7. From statement two we conclude that if X was a odd number Y must be an even number, therefore both statements are required in order to solve the question.

In a jar there are balls in different colors: blue, red, green and yellow.  
The probability of drawing a blue ball is  $1/8$ .

The probability of drawing a red ball is  $1/5$ .

The probability of drawing a green ball is  $1/10$ .

If a jar cannot contain more than 50 balls, how many yellow balls are in the Jar?

23.

20.

24.

17.

25.

The best answer is A.

If  $1/8$  is the probability of drawing a blue ball then there are  $40/8 = 5$  blue balls in the jar. And with the same principle there are 8 red balls and 4 green ones.  $40 - 5 - 8 - 4 = 23$  balls (yellow is the only color left).

A Barman's train rails across an open track at 250 kilometers per hour. A regular passenger train travels at 68% of the Barman's train speed. If the two trains start moving from the same station at the same time, how much time longer will it take the passenger train than the Barman's to travel 850 kilometers?

2 hours and 24 minutes.

1 hour and 24 minutes.

2 hours and 36 minutes.

1 hour and 36 minutes.

5 hours.

The best answer is D.

Let's find the time it takes each train to travel 850 km.

The fast train:  $850 / 250 = 3.4$  hours.

The slow train:  $0.68 \times 250 = 170$  km/h. So the time is  $850 / 170 = 5$  hours. The difference between the travel times is 1.6 hours or 1 hour and 36 minutes.

A Hawk can glide for 4 consecutive hours without resting using thermals only. An eagle can glide 14.5% longer without resting using the same thermals. If an eagle makes 3 stops during a certain glide, each stop after gliding its maximum possible time, how many hours long was the glide not including the resting time?

18.32.

13.74.

15.66.  
9.16.  
16.

The best answer is A.

14.5% of 4 are 0.58. Thus, an eagle can fly for 4.58 consecutive hours without resting. Since the eagle rested 3 times, he could glide four periods  $4 \times 4.58$  hours = 18.32 hours.

Ruth's age is two-thirds of Chris's age. How old is Chris?

Two years ago Ruth was half the age Chris is today.

Four and a half years from now Ruth will be seven eights of Chris's age.

Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

Either statement BY ITSELF is sufficient to answer the question.

Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is D.

From the question we know that  $R$  (Ruth) =  $\frac{2}{3} \cdot C$  (Chris). That's one equation with two variables; we need one more equation to solve the problem. Both statements are suitable equations and thus the answer is (d).

Bob is older than his brother, Jimmy. How old is Jimmy?

Two years ago Jimmy was one-third of bob's age today.

In six years from today Bob will be three times Jimmy's age today.

The best answer is E.

Build an equation from each statement both equations are identical. Since we need two different equations to find two unknowns, we cannot solve this question.

If  $X$  is divisible by 4, is  $Y$  odd?

$$y = x + 3.$$

$$x = 4.$$

The best answer is A.

From the question one can conclude that  $x$  is even. From statement one: an even number + odd number is an odd number. Thus,  $y$  must be odd. Statement two doesn't mention  $y$  at all, and is therefore insufficient

If  $W$  is divisible by 7, is  $Z$  even or odd?

$$Z = W + 1.$$

$$W = 7.$$

a) Statement (1) BY ITSELF is sufficient to answer the question, but statement (2) by itself is not.

b) Statement (2) BY ITSELF is sufficient to answer the question, but statement (1) by itself is not.

c) Statements (1) and (2) TAKEN TOGETHER are sufficient to answer the question, even though NEITHER statement BY ITSELF is sufficient.

d) Either statement BY ITSELF is sufficient to answer the question.

e) Statements (1) and (2) TAKEN TOGETHER are NOT sufficient to answer the question, requiring more data pertaining to the problem.

The best answer is E.

From the question we don't know if  $W$  is even or odd ( $W = 7, 14, 21, 28, \dots$ ) so statement one also is not helpful. From statement two we get no connection to  $Z$  so it's not sufficient either.

If  $x = y + 3 + 4.5x$  and  $y = x + 18$ , what is the value of  $x/y$  ?

- 1/4.
- 5/6.
- 6/5.
- 7/20.
- 1.5.

The best answer is D.

Solve two equations with two variables. Put  $y$  in the first equation.

We'll get  $x = (x + 18) + 3 + 4.5x$ , the value of  $x$  is  $-14/3$  and  $y = 40/3$ .  $x/y = -7/20$ .

If  $X^2=Y$  and  $Y=4.5X+2.5$ , which of the following could be the value of  $y$ ?

- 25.
- 0.5.
- 5.
- 10.
- 15.5.

The best answer is A.

$Y=4.5X+2.5$ ,  $x = 5$  or  $-0.5$ .  $Y$  can be 25 ( $4.5*5 + 2.5$ ).

If  $-3x+4y=28$  and  $3x-2y=8$ , what is the product of  $x$  and  $y$ ?

- 428.
- 622.
- 464.
- 264.
- 642.

The best answer is D.

We can notice that adding both equations gives:  $2y = 36$  thus  $y = 18$ .

From one of the equations we can receive:  $x = 44/3$ , so the answer is  $18 \times 44/3 = 6 \times 44 = 264$ .

If  $X+Y = 2X-2Z$ ,  $X-2Y = 4Z$  and  $X+Y+Z = 21$ , what is the value of  $Y/Z$ ?

- 2.
- 4.5.
- 3.
- 1.7.
- 2.5.

The best answer is A.

There are three equations with three variables, the solution is:

$X = 0$ ,  $Y = 42$  and  $Z = -21$  so  $Y/Z$  is  $-2$ .

If  $X/Y = 3X$  and  $Y = 4-X$ , what can be the value of  $2X$ ?

- Seven and two thirds.
- Three and one third.
- Seven and one third.

Two and one third.  
Three and two thirds.

The best answer is C.

With both equations we'll get the following equation:  $x(3x-11) = 0$ . So, X is either 0 or  $11/3$  we want the value of  $2X$ , meaning (c).

What is  $0.05 * 0.05$  in terms of percents?

25%

2.5%

0.25%

0.025%

.0.025%

The best answer is C.

Since 0.05 and 0.05 each have 2 decimal places, their product must have 4 ( $2 + 2$ ) decimal places. Because  $5 \times 5$  is 25, you need to add 2 zeros to get the correct number of decimal places, so the product of 0.05 and 0.05 is 0.0025. To change a decimal to a percentage you multiply by 100 by moving the decimal point 2 places to the right, so 0.0025 is 0.25%.

What is  $0.04 \times 0.03 \times 0.2$  in terms of percent?

24%

2.4%

0.24%

0.024%

0.0024%

The best answer is D.

The number we're supposed to see in the answers is  $4 \times 3 \times 2 = 24$ . It fits all answers.

The real question is the decimal of the answer; the basic rule is to add the decimals ( $2+2+1=5$ ).

We want the answer in percent terms so we need to take two decimals down, overall- 3.

The answer is  $24/1000$  (3 decimals) = 0.024%

What is  $0.01 \times 5 \times 0.03$  in terms of percent?

15%

1.5%

0.15%

0.015%

0.0015%

The best answer is C.

Since 0.01 and 0.03 each have 2 decimal places, their product must have 4 ( $2 + 2$ ) decimal places. Because  $1 \times 3 \times 5$  is 15, you need to add 2 zeros to get the correct number of decimal places, so the product of 0.01, 5 and 0.03 is 0.0015. To change a decimal to a percentage you multiply by 100 and move the decimal point 2 places to the right, so 0.0015 is 0.15%.

A computer factory produces 4200 computers per month at a constant rate, how many computers are built every 30 minutes assuming that there are 28 days in one month?

2.25.

3.125.

4.5.

5.225.

6.25.

The best answer is B.

$4200/28$  is 150 computers per day,  $150/24 = 25/4$  computers per hour = 6.25. Every thirty minutes half of that number is made, 3.125.

A pizza house sells 30 pizzas on a Friday night. On a weekday it sells 11% less. How many pizzas will the pizza house sell in a 28 days month assuming that Saturday is a “no business” day?

320.

654.

600.

540.

The best answer is B.

On a weekday the pizza house sells 89% of 30 = 26.7 pizzas.

In a month there are 4 Fridays ---> 4 x 30 = 120 pizzas.

There are 4 x 5 weekdays (there is no Saturday) ---> 20 x 26.7 = 534. All together 654 pizzas.

Bart is working as a paper delivery boy in Springfield. He delivers 620 newspapers every day except on Saturdays and Sundays. If Bart earns 4.2 cents for every second newspaper he delivers, how much money can he earn in a month with 28 days?

- 378.2 \$
- 376.5 \$
- 287.8 \$
- 260.4 \$
- 96.9 \$

The best answer is D

$(310 \text{ newspapers a day}) \times (5 \text{ days}) \times (4 \text{ weeks}) \times (4.2 \text{ cents}) = 26040 \text{ cents} = 260.4\$$ .

A young and energetic cobbler fixes 3650 pairs of shoes every year, while an old yet experienced cobbler fixes 20% less than the young cobbler. In a shoe factory there are two old and one young cobblers working together. How many shoes can the factory fix every day assuming that there are 365 days a year?

- 26.
- 34.
- 36.
- 44.
- 48.

The best answer is A.

An old cobbler fixes  $0.8 \times 3650 = 2920$  shoes per year. In the factory there are two old and one young cobbler --->  $3650 + 2920 + 2920 = 9490$  shoes per year.

9490 shoes divided by 365 days is 26 shoes per day.

A carpenter makes 3 bunk beds every day. A military school needs to organize a place to sleep for 143 soldiers. If there are 5 carpenters working on the job, how

many whole days in advance should they receive the order and start working in order to finish the right number of beds assuming that each bunk-bed is used by two soldiers?

- 4.
- 5.
- 6.
- 7.

The best answer is C.

143 soldiers is not an even number so we need at least 72 beds (one will sleep alone).

The carpenters together can complete 15 beds a day.  $72/15$  is between 4 and 5 so they will need 5 days notice in order to complete the job on time.