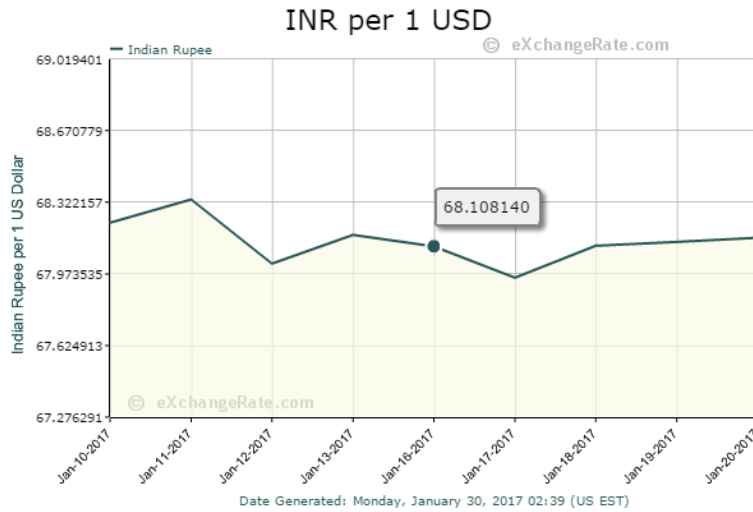


- 1) the graph shows the closing prices of Indian rupee per 1 us dollar from jan 10 to jan 20. For how many days is the closing price less than the previous days closing price?(consider days from jan 11 to jan 19 inclusive , 14, 15 have no closing prices since they are weekends)



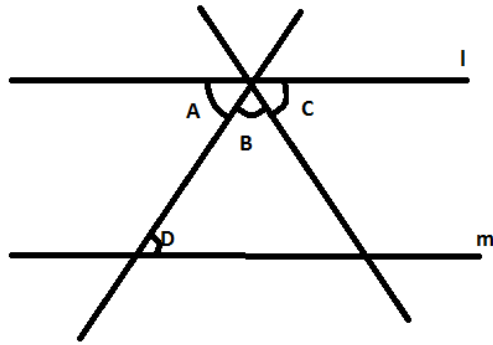
- A2  
**B3**  
 C4  
 D5

Sol : count the no of dips in the graph

- 2) If  $ab = k$  where  $k$  is a constant; If  $a = 12$  when  $b = 15$  what is the value of  $b$  when  $a = 9$ ?

- A 12  
 B 15  
**C 20**  
 D 25

Sol :  $12 * 15 = 9 * b$  ;  $b = 20$



3) In the figure above, lines l and m are parallel . If  $a = c$  and  $D = 50$ . what is the measure of angle b?

A 50

B 60

C 70

**D 80**

Sol : since l is parallel to m ,  $d = a = c = 50$  ;

$A + b + c = 180$ ;  $b = 180 - 100 = 80$

4) If x less than 16 is equal to the sum of 4x and 6. What is the value of 3x?

**A 2**

B 6

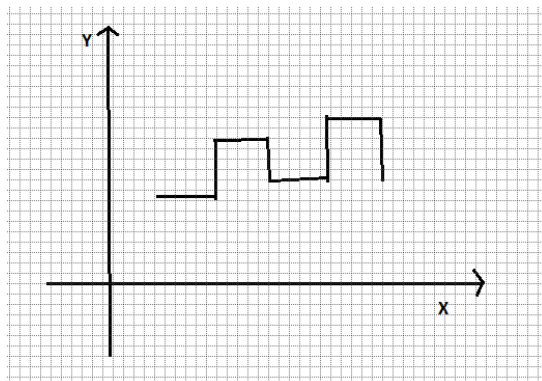
C 9

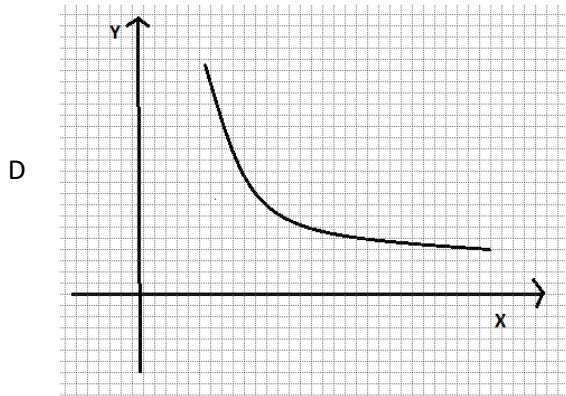
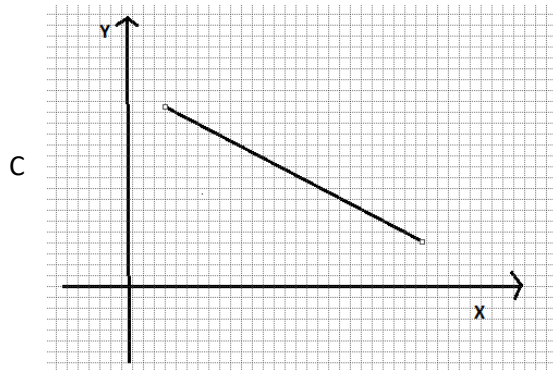
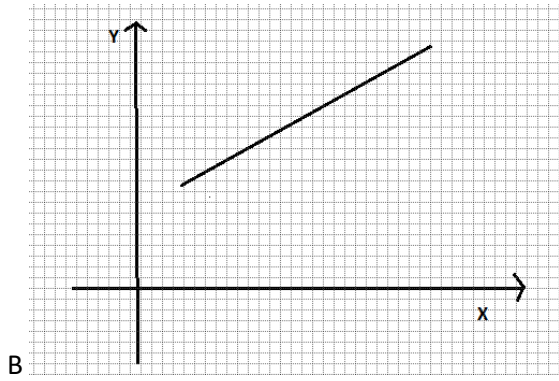
D 12

Sol:  $16 - x = 4x + 6$ ;  $5x = 10$  ;  $x = 2$

5) Which of the following graphs best shows a strong positive association between x and y?

A





Sol : positive association is when x increases y should also increase. Which happens in B

---

6)

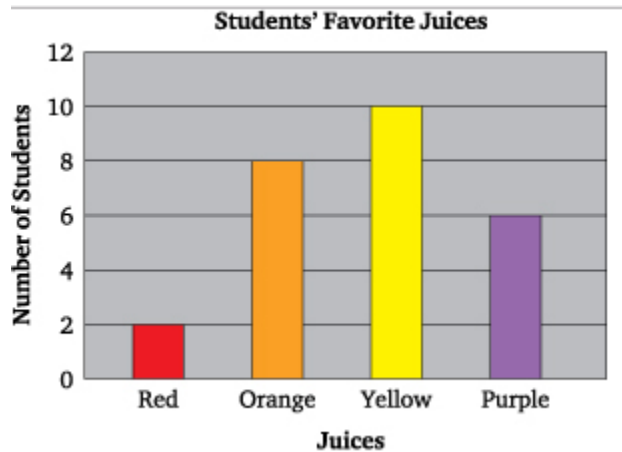
12 inches = 1 foot  
3 feet = 1 yard

The length of the rectangular football field is 120 yards. Based on the information given in the box above, what is the length of the football field in inches?

- A 480
- B 4320**
- C 30
- D 0.3

Sol: 120 yards = 3 x120 feet= 12 x3x120 inches = 4320 inches

7)



The graph above shows the number of students in a school who like different colored Juices. If the total number of students in the school are 2600 then What is an appropriate label of the vertical axis of the graph?

- A Number of students (in tens)
- B Number of students ( in hundreds)**
- C Number of students ( in thousands)
- D Number of students ( In tens of thousands)

Sol: total no of students on the y axis = 2 + 8 + 10 + 6 = 26. The number of students should be in hundreds.

8) For what value of  $x$  will the expression  $|2x + 5| + 6$  equal to 5?

A  $-5/2$

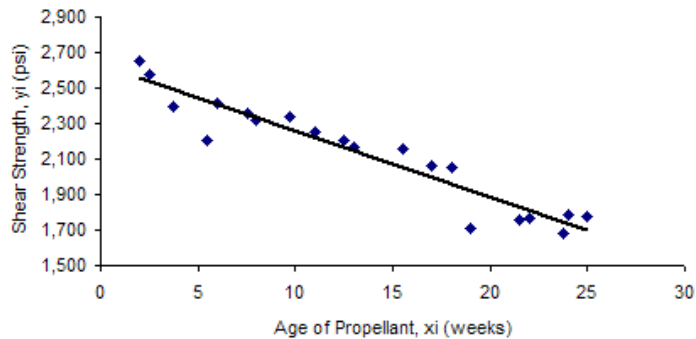
B  $5/2$

C 6

**D** There is no such value of  $x$

Sol: since  $|2x + 5| \geq 0$  ;  $|2x + 5| + 6 \geq 6$  ; So, there is no such value of  $x$ ;

---



$$Y = 2600 - 37.5x$$

9) The shear strength of the propellant depends on the age of the propellant. The formula above shows the relationship between shear strength  $y$ (psi) and the age of the propellant  $x$  ( weeks) . which of the following expresses the age of the propellant in terms of shear strength?

A  $37.5/(2600-y)$

B  $(2600+y) / 37.5$

C  $(y-2600)/37.5$

**D**  $(2600-y)/37.5$

Sol :  $Y = 2600 - 37.5x$  ;  $37.5x = 2600 - y$ ;  $x = (2600 - y)/37.5$ ;

---

10) Approximately, How many weeks will the propellant last if the shear strength measures as 1100 psi?

**A** 40

B 30

C 20

D 10

Sol:  $1100 = 2600 - 37.5x$  ;  $37.5x = 2600 - 1100 = 1500$ ;  $x = 1500/37.5 = 40$

---

11)  $-5x + 3 \leq -3x + 5$

Consider the above inequality, which of the following is NOT the solution?

A 1

B 0

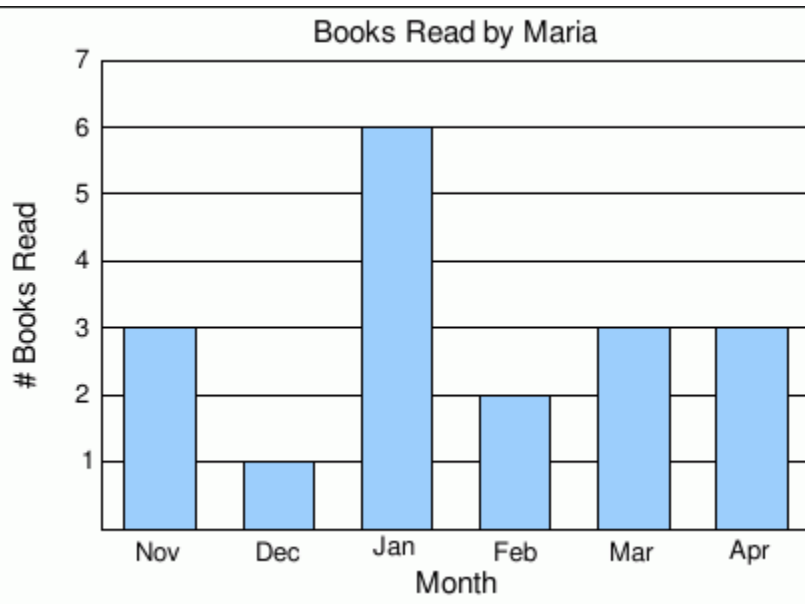
C -1

**D -2**

Sol:  $-5x + 3 \leq -3x + 5$  ;  $-2 \leq 2x$  ;  $-1 \leq x$ ; -2 is NOT a solution of  $-1 \leq x$ .

---

12)



Based on the histogram above, Which is the average (arithmetic mean) of number of books read by Maria from nov to april?

A 2

**B 3**

C 4

D 5

Sol:  $(3 + 1 + 6 + 2 + 3 + 3) / 6 = 18/6 = 3$

---

|       | Q1 | Q2 | Q3 | Q4 | total |
|-------|----|----|----|----|-------|
| North | 15 | 20 | 25 | 10 | 70    |
| South | 30 | 35 | 45 | 40 | 150   |
|       | 45 | 55 | 70 | 50 | 220   |

13) The table above shows the sales performance in million dollars of two regions north and south in all the four quarters. Which of the following categories accounts for approximately 20.5 percent of all the sales in the year?

A sales in north region in Q3

**B** Sales in south region in Q3

C sales in North region Q2

D Sales in South region Q4

Sol: 20 percent of 220 = 44 . which corresponds to sales in south region in Q3.

14)

| Heights of 16 students in class in inches |     |     |     |     |
|---|-----|-----|-----|-----|
| 4   | 4.1 | 4.1 | 4.3 | 4.5 |
| 4.5                                       | 4.7 | 4.7 | 5   | 5.1 |
| 5.1                                       | 5.2 | 5.5 | 5.5 | 5.6 |
| 7.5                                       |     |     |     |     |

The heights of 16 students in the class are given above in the table. The outlier measurement of 7.5 ft is an error. Of the mean, median and range of the values listed, which will change the most if 7.5 ft measurement is removed from the data?

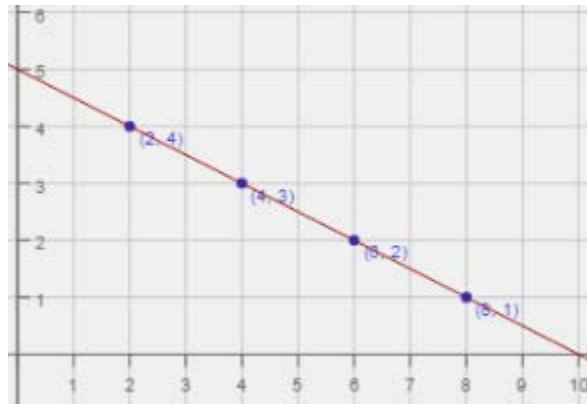
A Mean

B Median

**C** Range

D the above three will all change by the same amount

Sol: Range has a bigger effect when an outlier is removed. Hence C.



Questions 15 and 16 refer to the following information

The graph above displays the cost of apples per kg ( $c$ ) for  $n$  kgs of apples. X axis is the number of kgs brought ( $n$ ) and y axis is the cost of apples per kg ( $c$ ) ( $n \geq 1$ ).

15) Which of the following is correct?

- A If you buy an extra  $\frac{1}{2}$  kg of apples the cost per kg reduces by 1 \$
- B If you buy an extra 1 kg of apples the cost per kg increases by 1 \$
- C If you buy an extra 1 kg of apples the cost per kg increases by  $\frac{1}{2}$  \$
- D** If you buy an extra 1 kg of apples the cost per kg reduces by  $\frac{1}{2}$  \$

Sol : from the graph it is clear that if you move one unit along the x axis the y value decreases by  $\frac{1}{2}$  unit.

---

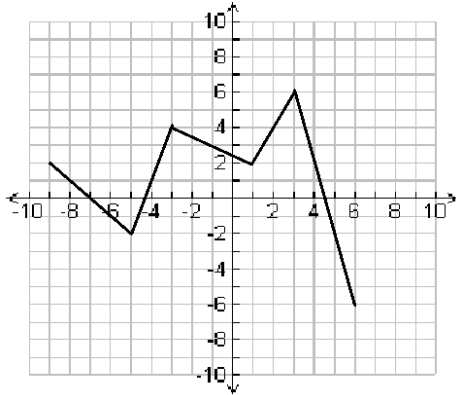
16) Which of the following represents the relationship between  $c$  and  $n$  ?

- A  $c = 2n + 5$
- B  $c = -2n + 5$
- C**  $c = -(1/2)n + 5$
- D  $c = (1/2)n + 5$

Sol: (2,4) which is on the line shown in the figure, satisfies only option choice c.

---





17) The function  $f$  is drawn in the  $xy$  plane above. For what value of  $x$  is  $f$  maximum?

A 4

**B 3**

C 2

D 1

Sol:  $f$  is maximum at  $x = 3$  from the graph shown

---

18)  $y < -2x - a$   
 $y > 3x - b$

In the  $xy$  plane, if  $(1,1)$  is a solution to the system of inequalities above, which of the following relationships between  $a$  and  $b$  must be true?

A  $|a| > b$

B  $a > b + 5$

C  $|a| > |b|$

**D  $b > 5 + a$**

Sol:  $1 < -2a$ ;  $1 > 3 - b$ ;

$a < -3$  and  $2 < b$  adding we get  $b > a + 5$

---

19) On a Sunday, a fruit vendor sells apples for 3.5 \$ each and oranges for 4.5 \$ each, the total revenue for selling 30 apples and oranges is 130 \$. How many oranges are sold that Sunday?

**A 25**

B 30

C 35

D 40

Sol:  $3.5x + 4.5y = 130$  and  $x + y = 30$ ; solving we get  $y = 25$ ; and  $x = 5$

---

20) Cathy went to a mall to buy a watch. The mall gives a discount of 20 % for all its customers. Cathy has a coupon which gives a discount of 10 % on the discounted price given by the mall . If Cathy paid  $p$  dollars for the watch , then which of the following is the original price of the watch in terms of  $p$ ?

A  $p/ (.30)$

**B**  $p/ (.80)(.90)$

C  $p/ (.70)$

D  $p/ (.90)$

Sol: if the original price of watch is  $x$  , then the discounted price is  $.80x$  and the coupon discount is  $(.90)(.80)x = p$ ;  $x = p/ (.80)(.90)$

---

21)

| product  | poor | satisfactory | Excellent | total |
|----------|------|--------------|-----------|-------|
| laptop   | 40   | 65           | 75        | 180   |
| monitor  | 30   | 50           | 60        | 140   |
| keyboard | 10   | 20           | 30        | 60    |
| mouse    | 20   | 30           | 45        | 95    |
| total    | 100  | 165          | 210       | 475   |

The data above is the feedback given by the customers for the various products. If a person is chosen at random from the group of people who have given poor or satisfactory then what is the probability that the person has given the feedback for keyboard?

A  $60/475$

B  $50/375$

C  $10/100$

**D**  $30/265$

Sol: The number of people who have given feedback as poor and satisfactory is  $100+165 = 265$  out of this  $10 + 20= 30$  gave feedback for keyboard.

So the probability =  $30/265$

---

Questions 22 and 23 refer to the following information.

| price and consumption                         | 1925 | 1926 | 1927 | 1928 |
|---|------|------|------|------|
| 1. PBE = Price of beef (cents/lb)             | 58.7 | 59.7 | 63   | 71.1 |
| 2. CBE = Consumption of beef per capita (lbs) | 58.6 | 59.4 | 53.7 | 48.1 |
| 3. PPO = Price of pork (cents/lb)             | 60.5 | 63.3 | 59.9 | 56.3 |
| 4. CPO = Consumption of pork per capita (lbs) | 65.8 | 63.3 | 66.8 | 69.9 |

Price and consumption per capita of beef and pork annually from 1925 to 1928 is shown in the table above.

- 22) Which of the following best approximates the average rate of change in the price of beef from 1925 to 1928
- A 3 cents per year
  - B 4 cents per year**
  - C 5 cents per year
  - D 6 cents per year

Sol: the average rate of change in the price of beef is the total change from 1925 to 1928 divided by the number of years which is 3.

$$(71 - 59) / 3 = 4 \text{ cents per year}$$

- 23) For how many years is the price of pork more than the price of the beef?
- A 4
  - B 3
  - C 2**
  - D 1

Sol: only for two years (1925 and 1926) is the price of the pork more than the price of beef

- 
- 24) Which of the following is an equation of a circle in the xy plane with center (4,5) and touches the x – axis?

A  $(x-4)^2 + (y-5)^2 = 16$

**B  $(x-4)^2 + (y-5)^2 = 25$**

C  $(x-5)^2 + (y-4)^2 = 16$

$$D (x-5)^2 + (y-4)^2 = 25$$

Sol: if center is (4,5) ; a or b could be the answer. If the circle touches x-axis radius is equal to 5. So the equation is  $(x-4)^2 + (y-5)^2 = 25$

---

25)  $N = -s^2 + 16s$

The equation above shows the number of passengers (n) in a bus at various stops(s) . The bus starts to travel from stop zero. At what stop will the number of passengers become again zero?

A 4

B 5

**C 16**

D 20

Sol:  $n = 0$  when  $-s^2 + 16s = 0 \Rightarrow s = 16$ ;

---

26) Box b contains 50% more apples than box a and box c contains 50% more apples than box B. If there are 190 apples in all the 3 buses, then how many apples are in box c?

A 40

B 60

**C 90**

D 100

Sol:  $x + (3/2)x + (9/4)x = 190$ ;

$x = 40$ ;  $(9/4)x = 90$

---

27)

|               | <i>apples</i> | <i>oranges</i> | <i>pears</i> | <i>plums</i> | <i>raisins</i> |
|---------------|---------------|----------------|--------------|--------------|----------------|
| <i>abby</i>   | 100           | 105            | 110          | 115          | 120            |
| <i>beth</i>   | 101           | 106            | 111          | 116          | 121            |
| <i>callie</i> | 102           | 107            | 112          | 117          | 122            |
| <i>dora</i>   | 103           | 108            | 113          | 118          | 123            |
| <i>elaine</i> | 104           | 109            | 114          | 119          | 124            |

A group of five friends started a fruit distribution business. Each of them wanted to trade apples, oranges, pears, plums and raisins. If the above table shows the number of fruits bought by each of them, Which of the following is a reasonable approximation of the total number of fruits in the storage?

A 270

- B** 2700
- C 27000
- D 270000

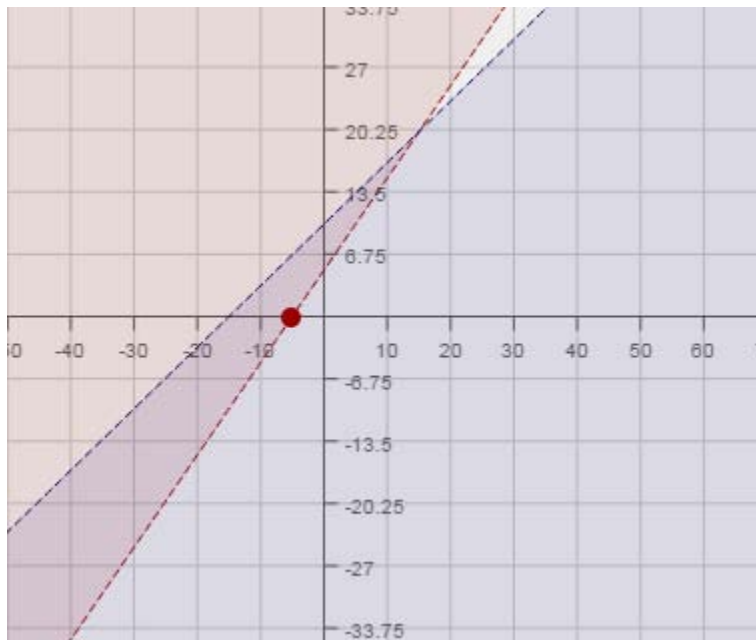
Sol: all these numbers are around 100 and there are 25 of these numbers. So the total should be close to 2500.

---

28) If the system of inequalities  $y > x + 5$  and  $y < \frac{2}{3}x + 10$  is graphed in the  $xy$  plane. Which quadrant contains no solutions to the system?

- A Quadrant I
- B Quadrant III
- C** Quadrant IV
- D there are at least one solution in all the four quadrants

Sol: If we draw the graph of the above inequality we get ; no point is in the fourth quadrant.



29) For a polynomial  $p(x)$ .  $p(4) = 0$ ; which of the following must be true about  $p(x)$ ?

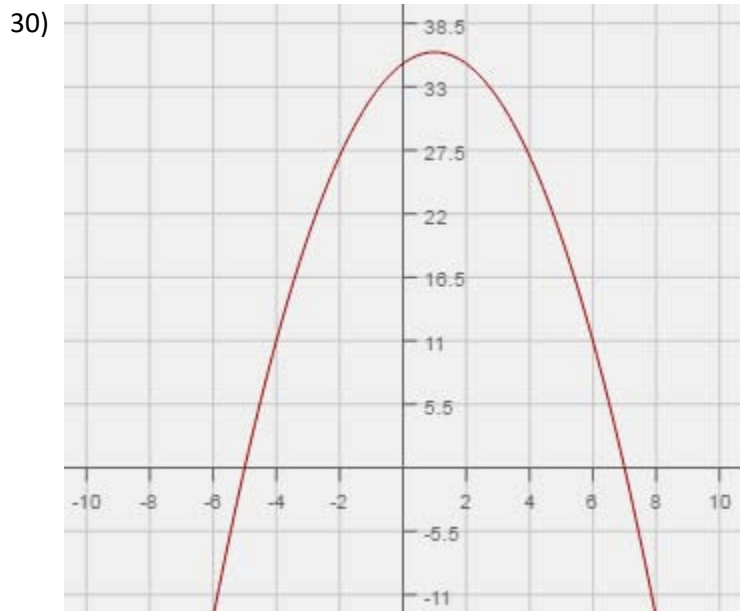
- A  $(x+4)$  is a factor of  $p(x)$
- B**  $(x-4)$  is a factor of  $p(x)$
- C The remainder when  $p(x)$  is divided by  $x - 2$  is 2

D the remainder when  $p(x)$  is divided by  $x+ 2$  is 2

Sol: if  $p(4) = 0$  then  $p(x)$  when divided by  $(x-4)$  gives a remainder of 0.

Hence  $(x-4)$  is a factor of  $p(x)$ .

---



If the equation of the above parabola drawn in the  $xy$  plane is  $y = -x^2 + 2x + 35$  then which of the following is the equivalent form of the equation of the graph where the maximum value of  $y$  can be identified as constant in the equation?

A  $y = -(x+5)(x-7)$

B  $y = -(x-5)(x+7)$

C  $y = -x(x-2) + 35$

**D**  $y = -(x-1)^2 + 36$

Sol:  $y = -x^2 + 2x + 35$ ;  $y = -x^2 + 2x - 1 + 36$ ;  $y = -(x-1)^2 + 36$  where 36 is the constant and is the maximum value of  $y$

---

**GRID IN**

31) Paul can read atleast 9 pages per hour and atmost 12 pages per hour, with the information given, what is the possible amount of time in hours that paul takes to read 50 pages?

5

Sol:  $9 < x < 12$ ;

$36 < 4x < 48$ ;  $45 < 5x < 60$ ;  $54 < 6x < 72$

So, it should be 5 hours, as 50 lies between 45 and 60

32) The lift operates with the cables and the tension In the cables should not be more than 2500 pounds. The weight of the lift is 800 pounds. What is the maximum number of people who can get into the lift if the average weight of all the people in the lift is 200 pounds?

8

Sol:  $800 + x (\text{average weight of people}) < 2500$

$800 + x (200) < 2500$ ;  $x < 1700/200$ ;  $x < 8.5$

Maximum number of people is 8 .

33)



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<http://www.mathgoodies.com>

According to the line graph shown, the number of people who came to the store at 11 am is what fraction of the number of people who came to the store at 2 pm?

$1/3$

Sol: At 11 am no of people are 5 and at 2 pm no of people are 15;

So the fraction is  $5/15 = 1/3$

---

34) A radio station is on line 24 hrs in a day. All the programs in this radio station have 30 min duration. Every radio program has 5 min for advertisement with in the 30 min duration. What is the total number of minutes for advertisements on Monday?

240

Sol: in 24 hours there are  $24 \times 2 = 48$  no of 30 min programs. So, the number of minutes for advertisements is  $48 \times 5 = 240$  min

---

35) A tent is in the shape of a right circular cone above. If the volume of the air inside the tent is  $75\pi$  cubic feet and the height of the tent is 9feet, then what is the diameter of the base of the tent in feet?

10

Sol:  $(1/3)\pi r^2 h = 75\pi$  ;  $r^2 = 25$ ;  $r = 5$ ;

Hence the diameter = 10;

---

36)  $g(x) = 1/(x^3 - 2x^2 + x - 2)$

For what value of x in the function g(x) above is undefined?

2

Sol:  $x^3 - 2x^2 + x - 2 = x(x^2 + 1) - 2(x^2 + 1) = (x-2)(x^2 + 1)$

$g(x) = 1/(x-2)(x^2 + 1)$ . Hence for  $x = 2$  g(x) is not defined.

---



**Questions 37 and 38 refer to the following information**

Aaron invests his money in a fund which earns 12% interest per annum compounded monthly. His initial deposit was 1000\$ and he uses the expression  $\$1000(x)^m$  to find the value of his money after m months.

37) What is the value of x in the expression?.

1.01

Sol: since it is compounded monthly, interest per month is  $12/12 = 1\%$  so the multiplying factor is 1.01.  $x = 1.01$

38) Aaron's friend carter invests his money in a fund which earns 12% interest per annum compounded annually. After 3 years , how much more money will Aaron's initial investment earn than carter's initial investment? ( round your answer to the nearest dollar and ignore the dollar sign when gridding your response)

26

$$\text{Sol: aaron's investement} = 1000 \cdot (1.01)^{36} = 1430.77$$

$$\text{Carter's investment} = 1000 \cdot (1.12)^3 = 1404.93$$

$$\text{Difference} = 1430.77 - 1404.93 = 26$$