RAVI TEST PAPERS WHATSAPP 8056206308

10TH COMPLETE GRAPH ANSWERS

10th Standard

Maths

1) Discuss the nature of solutions of the following quadratic equations.
$x^2 + x - 12 = 0$

2) Draw the graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$

3) Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$

4) Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$

5) Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$

6) Graph the following quadratic equations and state their nature of solutions $x^2 - 9x + 20 = 0$.

7) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$

8) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 + 1 = 0$

9) Draw the graph of $y = x^2 + 3x + 2$ and use it to solve $x^2 + 2x + 1 = 0$

10) Draw the graph of $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$

11) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$

12) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$

13) Draw the graph of $y = (x - 1)(x + 3)$ and hence solve $x^2 - x - 6 = 0$

14) Discuss the nature of solutions of the following quadratic equations.
$x^2 - 8x + 16 = 0$

15) Discuss the nature of solutions of the following quadratic equations.
$x^2 + 2x + 5 = 0$

16) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 4x + 4 = 0$

17) Graph the following quadratic equations and state their nature of solutions.
$x^2 + x + 7 = 0$

18) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 9 = 0$

19) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 6x + 9 = 0$

20) Graph the following quadratic equations and state their nature of solutions.
$(2x - 3)(x + 2) = 0$

21) A garment shop announces a flat 50% discount on every purchase of items for their customers. Draw the graph for the relation between the Marked Price and the Discount. Hence find

i. the marked price when a customer gets a discount of Rs. 3250 (from graph)

ii. the discount when the marked price is Rs. 2500.

22) Draw the graph xy = 24, x, y > 0, Using the graph find,

(i) y when x = 3 and

(ii) x when y = 6.

23) A school announces that for a certain competitions, the cash price will be distributed for all the participants equally as shown below:

No. of participants (x)	2	4	6	8	10
Amount for each participant in Rs. (y)	180	90	60	45	36

i. Find the constant of variation.

ii. Graph the above data and hence find, how much will each participant get if the number of participants are 12.

24) Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

t 4 5	D	N	T	\	a
s 4 5	TD	bN	eT	DN\	Da

25) A bus is travelling at a uniform speed of 50 km/hr. Draw the distance-time graph and hence find

(i) the constant of variation

(ii) how far will it travel in $\frac{D}{N}$

(iii) the time required to cover a distance of 300 km from the graph.

26) A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below.

4 5	\C	aC	bC	ca
4 5	DaC	DNC	DCC	dC

(i) Graph the above data and identify the type of variation.

(ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?

(iii) If the work has to be completed by 200 days, how many workers are required?

27) Nishanth is the winner in a Marathon race of 12 km distance. He ran at the uniform speed of 12 km/hr and reached the destination in 1 hour. He was followed by Aradhana, Ponmozhi, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr and 2 km/hr. And, they covered the distance in 2 hrs, 3 hrs, 4 hrs and 6 hours respectively. Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.

28) Graph the following linear function k $\frac{D}{N}$. Identify the constant of variation and verify it with the graph. Also

(i) find y when x = 9

(ii) find x when y = 7.5.

29) The following table shows the data about the number of pipes and the time taken to till the same tank.

4 5	N	T	b	e
4 54 5	\a	TC	Da	DC

Draw the graph for the above data and hence
(i) find the time taken to fill the tank when five pipes are used
(ii) Find the number of pipes when the time is 9 minutes.

30) A two wheeler parking zone near bus stand charges as below

4 5	\	d	DN	N\
p =4 5	bC	DNC	DdC	TbC

Check if the amount charged are in direct variation or in inverse variation to the parking time. Graph the data. Also
(i) find the amount to be paid when parking time is 6 hr;
(ii) find the parking duration when the amount paid is Rs. 150.

31) Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$

32) A garment shop announces a 50% discount on every purchase of items for their customers. Draw the graph for the relation between the Marked Price and the Discount. Hence find
(i) the marked price when a customer gets a discount of Rs.3250 (from graph)
(ii) the discount when the marked price is Rs.2500.

33) Draw the graph of $xy = 24$, $x,y > 0$. Using the graph find,
(1) y when $x = 3$ and (ii) x when $y = 6$.

34) Draw the graph of $xy = 24$, $x, y > 0$. Using the graph find
i) y when $x = 3$ and ii) x when $y = 6$. < /div >

35) A school announces that for a certain competitions, the cash prince will be distributed for all the participants equally as show below.
i) Find the Contstant of Variation
ii) Graph the above data and hence, find how much will each participant get if the number of participants are 12.

t 4 5	D	N	T	\	a
s 4 5	TD	bN	eT	DN	Daa

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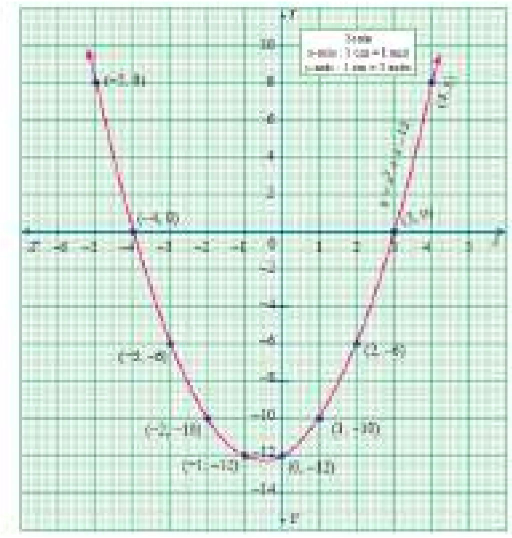
Maths

1) $x^2 + x - 12 = 0$

Step 1 Prepare the table of values for the equation $y = x^2 + x - 12$

x	-5	-4	-3	-2	-1	0	1	2	3	4
y	8	0	-6	-10	-12	-12	-10	-6	0	8

Step 2: Plot the points for the above ordered pairs (x, y) on the graph using suitable scale.



Step 3: Draw the parabola and mark the co-ordinates of the parabola which intersect the X axis.

Step 4: The roots of the equation are the x coordinates of the intersecting points (–4, 0) and (3,0)of the parabola with the X axis which are −4 and 3 respectively.

Since there are two points of intersection with the X axis, the quadratic equation $x^2 + x - 12 = 0$ has real and unequal roots

2) Step 1: Draw the graph of $y = 2x^2$ by preparing the table of values as below

x	-2	-1	0	1	2
y	3	2	0	2	8

Step 2 : To solve $2x^2 - x - 6 = 0$, subtract $2x^2 - x - 6 = 0$ from $y = 2x^2$

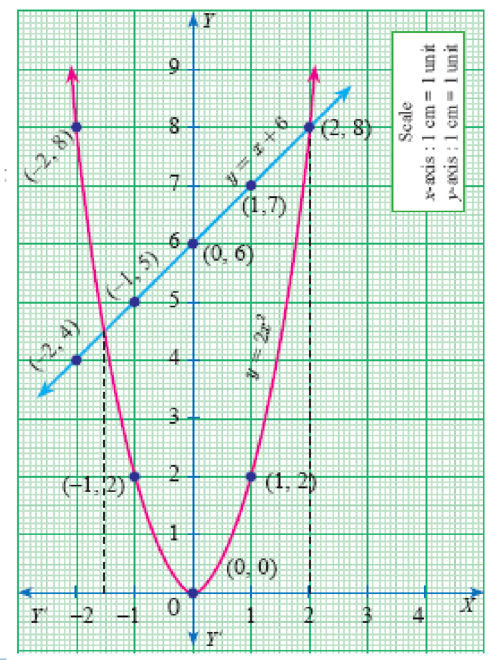
that is
$$\begin{aligned} y &= 2x^2 \\ 0 &= 2x^2 - x - 6 \quad (-) \\ \hline y &= x + 6 \end{aligned}$$

The equation y = x + 6 represents a straight line. Draw the graph of y = x + 6 by forming table of values as below

x	-2	-1	0	1	2
y	4	5	6	7	8

Step 3 : Mark the points of intersection of the curve $y = 2x^2$ and the line y = x + 6. That is, (–1.5, 4.5) and (2,8)

Step 4 : The x coordinates of the respective points forms the solution set {–1.5,2} for $2x^2 - x - 6 = 0$



3) Step 1 : Draw the graph of $y = x^2 + 4x + 3$ by preparing the table of values as below

x	-4	-3	-2	-1	0	1	2
y	3	0	-1	0	3	8	15

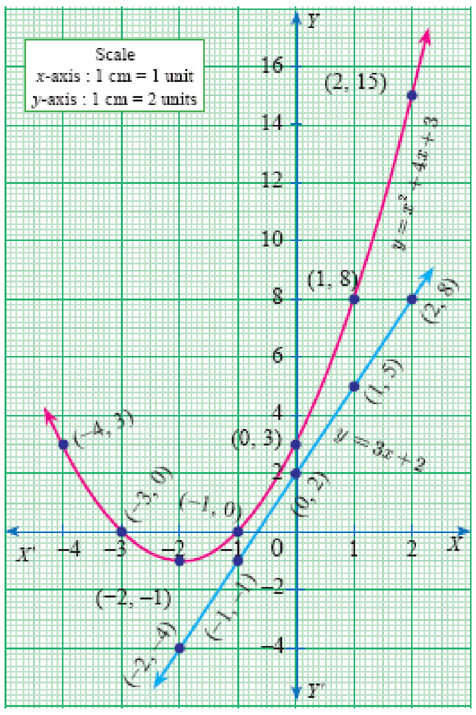
Step 2 : To solve $x^2 + x + 1 = 0$, subtract $x^2 + x + 1 = 0$ from $y = x^2 + 4x + 3$ that is,

$$\begin{array}{rl} y = & x^2 + 4x + 3 \\ 0 = & x^2 + x + 1 \\ \hline y = & 3x + 2 \end{array} \quad (-)$$

The equation represent a straight line. Draw the graph of y = 3x + 2 forming the table of values as below

x	-2	-1	0	1	2
y	-4	-1	2	5	3

Step 3 : Observe that the graph of y = 3x + 2 does not intersect or touch the graph of the parabola $y = x^2 + 4x + 3$.



Thus $x^2 + x + 1 = 0$ has no real roots.

4) Step 1 : Draw the graph of $y = x^2 + x - 2$ by preparing the table of values as below

x	-3	-2	-1	0	1	2
y	4	0	-2	-2	0	4

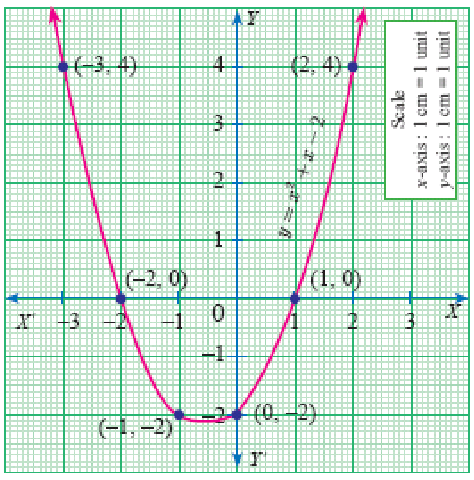
Step 2 : To solve $x^2 + x - 2 = 0$ subtract $x^2 + x - 2 = 0$ from $y = x^2 + x - 2$

that is
$$\begin{array}{rl} y = & x^2 + x - 2 \\ 0 = & x^2 + x - 2 \\ \hline y = & 0 \end{array} \quad (-)$$

The equation y = 0 represents the X axis.

Step 3 : Mark the point of intersection of the curve $x^2 + x - 2$ with the X axis. That is (–2,0) and (1,0)

Step 4 : The x coordinates of the respective points form the solution set {–2,1} for $x^2 + x - 2 = 0$



5) Step 1 : Draw the graph of $y = x^2 - 4x + 3$ by preparing the table of values as below

x	-2	-1	0	1	2	3	4
y	15	8	3	0	-1	0	3

Step 2 : To solve $x^2 - 6x + 9 = 0$, subtract $x^2 - 6x + 9 = 0$ from $y = x^2 - 4x + 3$

that is
$$\begin{array}{rl} y = & x^2 - 4x + 3 \\ 0 = & x^2 - 6x + 9 \\ \hline y = & 2x - 6 \end{array} \quad (-)$$

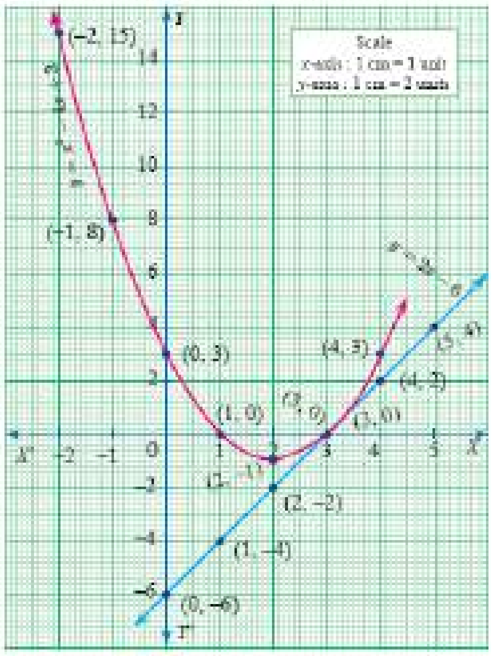
The equation y = 2x - 6 represent a straight line. Draw the graph of y = 2x - 6 forming the table of values as below.

x	0	1	2	3	4	5
y	-6	-4	-2	0	2	4

The line y = 2x - 6 intersect $y = x^2 - 4x + 3$ only at one point.

Step 3 : Mark the point of intersection of the curve $y = x^2 - 4x + 3$ and y = 2x - 6 that is (3,0).

Therefore, the x coordinate 3 is the only solution for the equation $x^2 - 6x + 9 = 0$



6) $x^2 - 9x + 20 = 0$

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
-9x	+36	27	18	9	0	-9	-18	-27	-36
20	20	20	20	20	20	20	20	20	20
	72	56	42	30	20	12	6	2	0

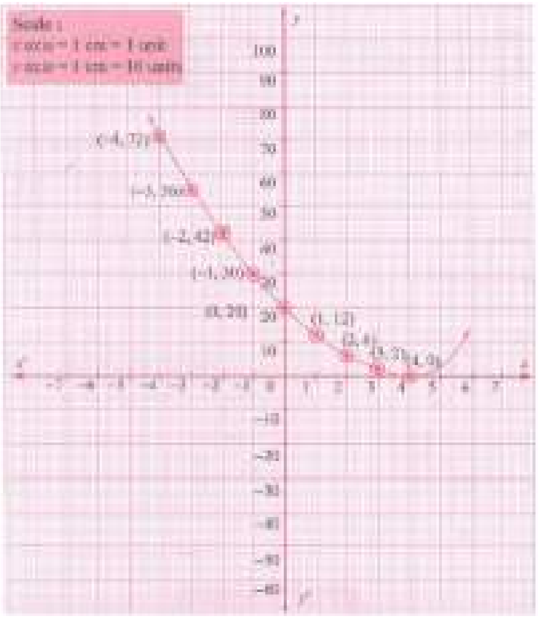
Step 1:

Points to be plotted: (-4, 72), (-3,56), (-2,42), (-1, 30), (0, 20), (1, 12), (2, 6), (3, 2), (4, 0)

Step 2:

The point of intersection of the curve with x axis is (4, 0)

Step 3:

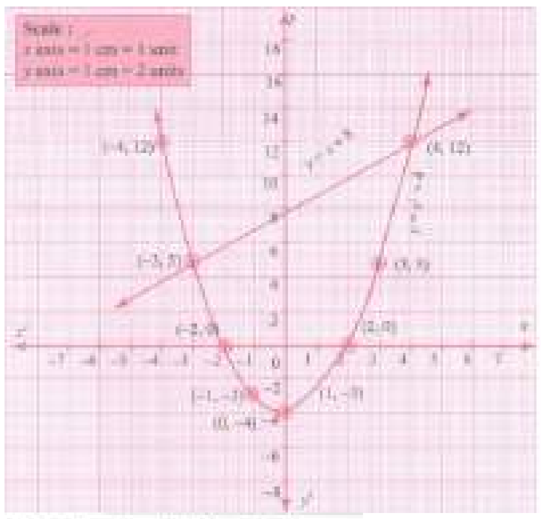


Since there is only one point of intersection with X axis, the quadratic equation $x^2 + 9x + 20 = 0$ has real and equal roots.

∴ Solution {4,4}

7)

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
x^2-4	12	5	0	-3	-4	-3	0	5	12



$$
\begin{aligned}
\text{To solve } x^2 - x - 12 &= 0 \\
x^2 - 4 &= y \\
x^2 - x - 12 &= 0 \\
(-)\ (+)\ (+) \quad & \quad (-) \\
\hline
x + 8 &= y \\
y &= x + 8
\end{aligned}
$$

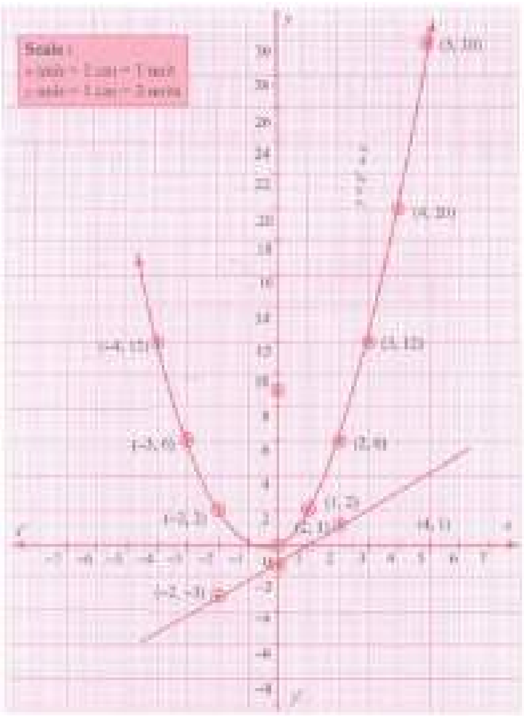
x	-4	-3	-2	-1	0	1	2	3	4
8	8	8	8	8	8	8	8	8	8
x-8	4	5	6	7	8	9	10	11	12

Point of intersection (-3,5), (4, 12) solution of x^2 -x - 12 = 0 is -3, 4

8)

x	-4	-3	-2	-1	0	1	2	3	4	5
x^2	16	9	4	1	0	1	4	9	16	25
+x	-4	-3	-2	-1	0	1	2	3	4	5
$y=x^2+x$	12	6	2	0	0	2	6	12	20	30

Draw the parabola by the plotting the points (-4, 12), (-3, 6), (-2, 2), (-1, 0), (0, 0), (1, 2), (2, 6), (3, 12), (4,20), (5, 30)



To solve: $X^2 + 1 = 0$, subtract $X^2 + 1 = 0$ from $y = X^2 + x$.

$$
\begin{aligned}
&x^2 + 1 = 0 \text{ from } y = x^2 + x \\
\text{i.e.} \quad y &= x^2 + x \\
0 &= x^2 + 1 \\
(-) \quad & (-) \quad (-) \\
\hline
y &= x - 1
\end{aligned}
$$

This is a straight line.

Draw the line y = x - 1.

x	-2	0	2
-1	-1	-1	-1
y	-3	-1	1

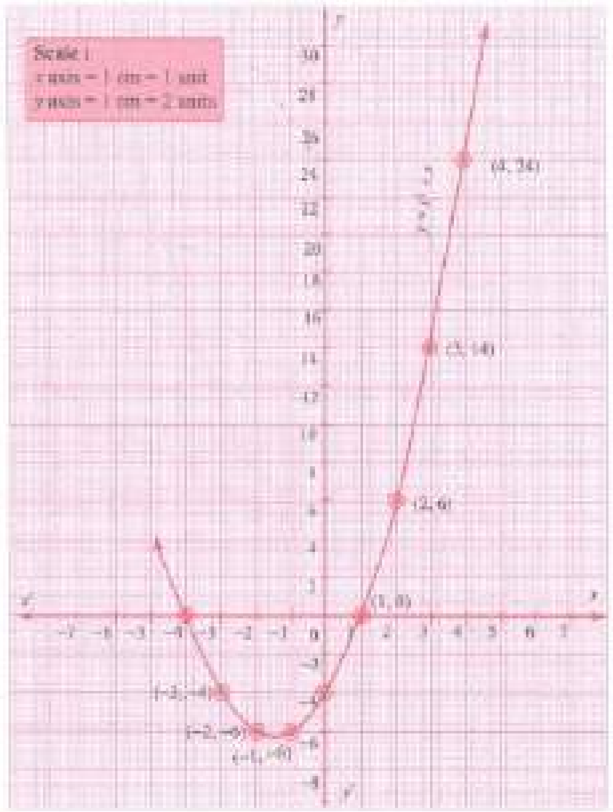
Plotting the points (-2, -3), (0, -1), (2, 1) we get a straight line. This line does not intersect the parabola. Therefore there is no real roots for the equation $X^2 + 1 = 0$.

9) -1

10) $y=x^2+3x-4$

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
3x	-12	-9	-6	-3	0	3	6	9	12
-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
$y=x^2+3x-4$	0	-4	-6	-6	-4	0	6	14	24

Draw the parabola using the points (-4, 0), (-3, -4), (-2, -6), (-1, -6), (0, -4), (1, 0), (2, 6), (3, 14), (4,24).



To solve: $X^2 + 3x - 4 = 0$ subtract $X^2 + 3x - 4 = 0$ from $y = X^2 + 3x - 4$

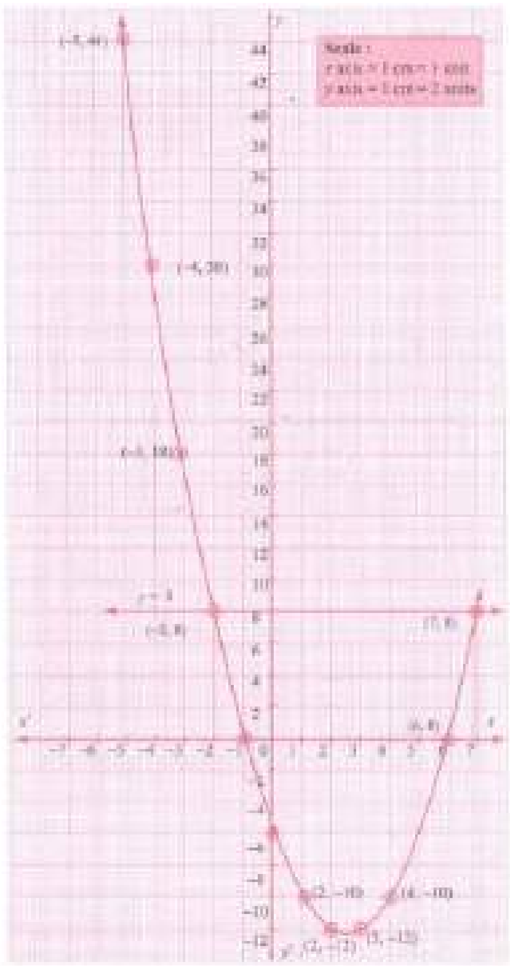
$$\begin{aligned} y &= x^2 + 3x - 4 \\ 0 &= x^2 + 3x + 1 \\ &\quad (-)\ (-)\ \ (+) \\ \hline y &= 0 \end{aligned}$$
is the equation of the x axis.

The points of intersection of the parabola with the x axis are the points (-4, 0) and (1, 0), whose x - co-ordinates (-4, 1) is the solution, set for the equation X2 + 3x - 4 = 0.

11)

x	-5	-4	-3	-2	-1	0	1	2	3	4
x^2	25	16	9	4	1	0	1	4	9	16
-5x	25	20	15	10	5	0	-5	-10	-15	-20
-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
$y=x^2+5x-6$	44	30	18	8	0	-6	-10	-12	-12	-10

Draw the parabola using the points (-5, 44), (-4, 30), (-3, 18), (-2, 8), (-1, 10), (0, -6), (1, -10), (2, -12), (3, -12), (4, -10)



To solve the equation $X^2 - 5x - 14 = 0$, subtract $X^2 - 5x - 14 = 0$ from $y = X^2 - 5x - 6$.

$$\begin{aligned} y &= x^2 - 5x - 6 \\ 0 &= x^2 - 5x - 14 \\ &\quad (-)\ (+)\ \ \ (+) \\ \hline y &= \qquad 8 \end{aligned}$$
is a straight line parallel to x axis.

The co-ordinates of the points of intersection of the line and the parabola forms the solution set for the equation $X^2 - 5x - 14 = 0$.

∴ Solution {-2, 7}

12)

x	-4	-3	-2	-1	0	1	2	3	4

x^2	16	9	4	1	0	1	4	9	16
$-2x^2$	32	18	8	2	0	2	8	18	32
-3x	12	9	6	3	0	-3	-6	-9	-12
-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
$y=x^2-3x-5$	39	22	9	0	-5	-6	-3	4	15

Draw the parabola using the points (-4, 39), (-3, 22), (-2, 9), (-1, 10), (0, -5), (1, -6), (2, -3), (3, 4), (4, 15).

To solve $2x^2 - 4x - 6 = 0$, subtract it from $y = 2x^2 - 3x - 5$

$$\begin{aligned} y &= \cancel{2x^2} - 3x - 5 \\ 0 &= \cancel{2x^2} - 4x - 6 \\ & \quad (-) \quad (+) \qquad (+) \\ \hline y &= \qquad\quad x + 1 \end{aligned}$$

is a straight line

x	-2	0	2
1	1	1	1
y=x+1	-1	1	3

Draw a straight line using the points (-2, -1), (0, 1), (2, 3). The points of intersection of the parabola and the straight line forms the roots of the equation.

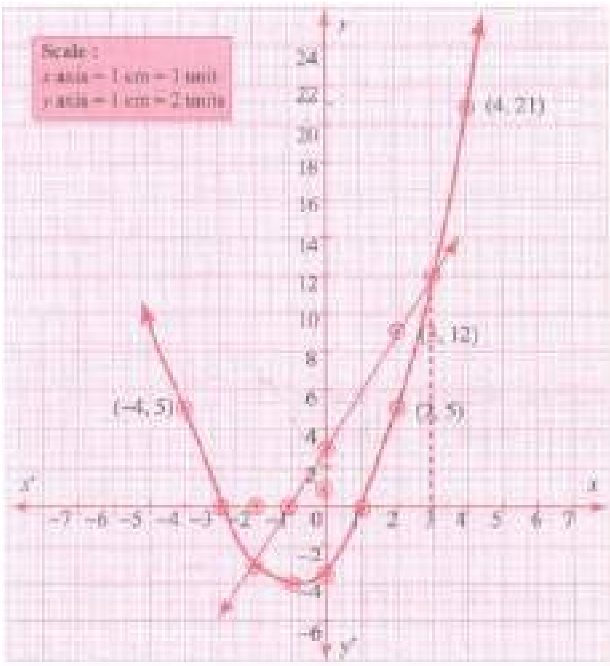
The x-coordinates of the points of intersection forms the solution set.

∴ Solution {-1, 3}

13)

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
2x	-8	-6	-4	-2	0	2	4	6	8
-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
$y=x^2+2x-3$	5	0	-3	-4	-3	0	5	12	21

Draw the parabola using the points (-4, 5), (-3, 0), (-2, -3), (-1, -4), (0, -3), (1, 0), (2, 5), (3,12), (4, 21)



$$\begin{aligned} y &= x^2 + 2x - 3 \\ 0 &= x^2 - x - 6 \\ & \quad (-) \quad (+) \quad (+) \\ \hline y &= \qquad 3x + 3 \end{aligned}$$

is a straight line

x	-2	-1	0	2
3x	-6	-3	0	6
3	3	3	3	3

y=3x+3	-3	0	3	9

Plotting the points (-2, -3), (-1, 0), (0, 3), (2, 9), we get a straight line.

The points of intersection of the parabola with the straight line gives the roots of the equation. The coordinates of the points of intersection forms the solution set.

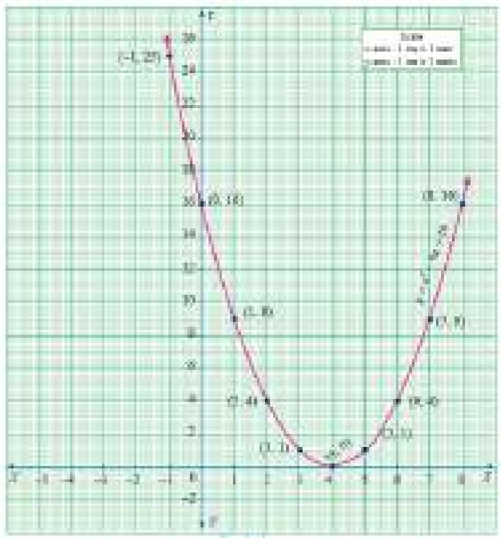
∴ Solution {-2, 3}

14) $x^2 - 8x + 16 = 0$

Step 1 Prepare the table of values for the equation $y = x^2 - 8x + 16$

x	-1	0	1	2	3	4	5	6	7	8
y	25	16	9	4	1	0	1	4	9	16

Step 2: Plot the points for the above ordered pairs (x, y) on the graph using suitable scale.



Step 3: Draw the parabola and mark the coordinates of the parabola which intersect with the X axis.

Step 4: The roots of the equation are the x coordinates of the intersecting points of the parabola with the X axis (4,0) which is 4.

Since there is only one point of intersection with X axis, the quadratic equation $x^2 - 8x + 16 = 0$ has real and equal roots.

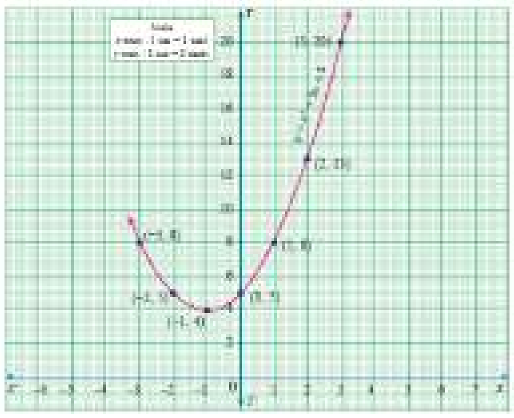
15) $x^2 + 2x + 5 = 0$

Let $y = x^2 + 2x + 5$

Step 1 Prepare a table of values for the equation $y = x^2 + 2x + 5$

x	-3	-2	-1	0	1	2	3
y	8	5	4	5	8	13	20

Step 2: Plot the above ordered pairs(x, y) on the graph using suitable scale.



Step 3: Join the points by a free-hand smooth curve this smooth curve is the graph of $y = x^2 + 2x + 5$

Step 4: The solutions of the given quadratic equation are the x coordinates of the intersecting points of the parabola the X axis.

Here the parabola doesn't intersect or touch the X axis.

So, we conclude that there is no real root for the given quadratic equation.

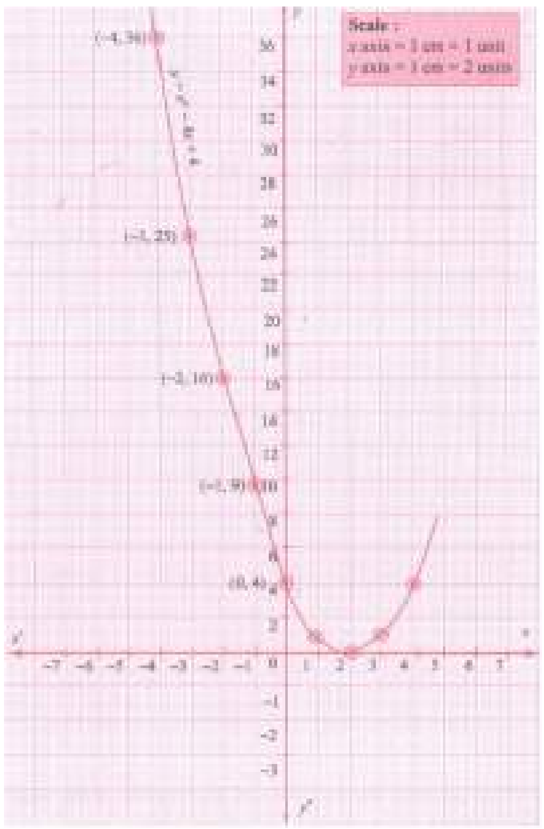
16) $x^2 - 4x + 4 = 0$

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
-4x	16	12	8	4	0	-4	-8	-12	-16
4	4	4	4	4	4	4	4	4	4
$y=x^2-4x+4$	36	25	16	9	4	1	0	1	4

Step 1: Points to be plotted: (-4,36), (-3, 25), (-2, 16), (-1, 9), (0, 4), (1, 1), (2, 0), (3, 1), (4,4)

Step 2: The point of intersection of the curve with x axis is (2, 0)

Step 3:



Since there is only one point of intersection with x axis, the quadratic equation $X^2 - 4x + 4 = 0$ has real and equal roots.

∴ Solution{2,2}

17) $x^2 + x + 7 = 0$

Let y=x2+x+7

Step 1:

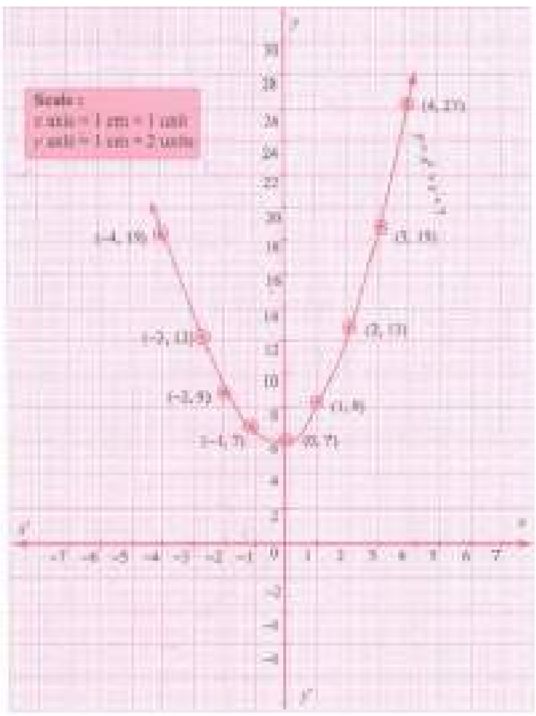
x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
7	7	7	7	7	7	7	7	7	7
$y=x^2-x+7$	19	13	9	7	7	9	13	19	27

Step 2:

Points to be plotted: (-4, 19), (-3, 13), (-2, 9), (-1, 7), (0, 7), (1, 9), (2, 13), (3, 19), (4, 27)

Step 3:

Draw the parabola and mark the co-ordinates of the parabola which intersect with the x-axis.



Step 4:

The roots of the equation are the points of intersection of the parabola with the x axis. Here the parabola does not intersect the x axis at any point.

So, we conclude that there is no real roots for the given quadratic equation.

18) $x^2-9=0$

Let $y=x^2-9$

Step 1:

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
$y=x^2-7$	7	0	-5	-8	-9	-8	-5	0	7

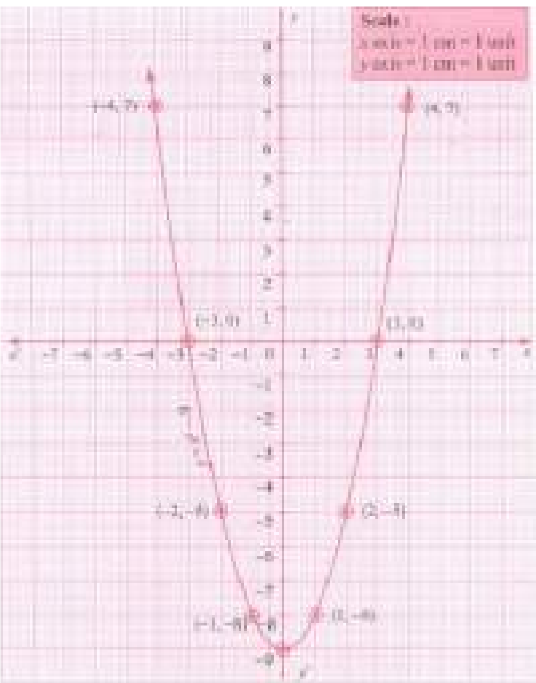
Step 2:

The points to be plotted: (-4,7), (-3, 0), (-2, -5), (-1, -8), (0, -9), (1, -8), (2, -5), (3, 0), (4, 7)

(v) Real and equal roots

Step 3:

Draw the parabola and mark the co-ordinates of the parabola which intersect the x-axis.



Step 4:

The roots of the equation are the co-ordinates of the intersecting points (-3, 0) and (3, 0) of the parabola with the x-axis which are -3 and 3 respectively.

Step 5:

Since there are two points of intersection with the x axis, the quadratic equation has real and unequal roots.

∴ Solution{-3, 3}

19) $x^2 - 6x + 9 = 0$

Let $y = X^2 - 6x + 9$

Step 1:

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
-6x	24	18	12	6	0	-6	-12	-18	-24
9	9	9	9	9	9	9	9	9	9
$y=x^2-6x+9$	49	36	25	16	9	4	1	0	1

Step 2:

Points to be plotted: (-4,49), (-3, 36), (-2, 25), (-1, 16), (0, 9), (1, 4), (2, 1), (3, 0), (4, 1)

Step 3:

Draw the parabola and mark the co-ordinates of the intersecting points

Step 4:

The point of intersection of the parabola with x axis is (3, 0)

Since there is only one point of intersection with the x-axis, the quadratic equation has real and equal roots.

∴ Solution (3, 3)

20) $(2x-3)(x+2)=0$

$2x^2 - 3x + 4x - 6 = 0$

$2x^2 + 1x-6 = 0$

Let $y = 2x^2 +X - 6= 0$

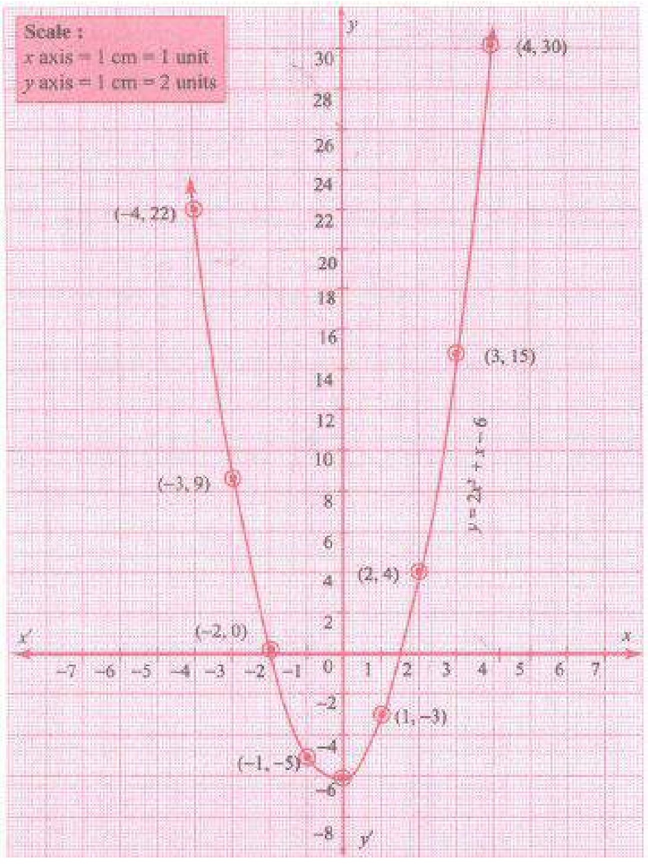
x	-4	-3	-2	-1	0	1	2	3	4
x^2	16	9	4	1	0	1	4	9	16
$2x^2$	32	18	8	2	0	2	8	18	32
x	-4	-3	-2	-1	0	1	2	3	4
-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
$y=x^2-x-6$	22	9	0	-5	-6	-3	-4	15	30

Step 2:

The points to be plotted: (-4,22), (-3, 9), (-2, 0), (-1, -5), (0, -6), (1, -3), (2,4), (3,15), (4, 30)

Step 3:

Draw. the parabola and mark the co-ordinates of the in. tersecting point of the parabola with the x-axis.



Step 4:

The points of intersection of the parabola with the x-axis are (-2, 0) and (1.5,0).

Since the parabola intersects the x-axis at two points, the equation has real and unequal roots

∴ Solution {-2, 1.5}

21) Let y be the marked price of an item and x be the discount on that item

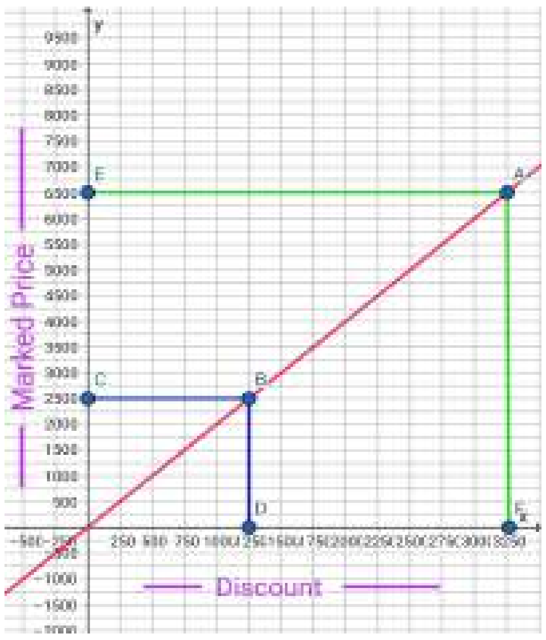
Now it is given that the garment shop announces a flat 50% discount on every purchase of items for their customers

m a= D==

m D L

m L

Which is the required relationship between the Marked Price and the Discount.



(1) We have to find the marked price when a customer gets a discount of 3250

As discount is 3250

In the graph is represent the point F (3250, 0)

If we draw a line parallel to Y axis and passing through the point F(3250, 0) then it intersects the line y = 2x at B(3250, 6500)

Accordingly we get the point A (3250, 6500)

Hence the Marked Price = 6500

Manually it can be checked

As discount is 3250

x = 3250

So y = 2 x 3250 = 6500

(2) We have to find the discount when the marked price is 2500

As marked price is 2500

In graph it represent the point C(0, 2500)

If we draw a line parallel to X axis and passing through the point C(0, 2500) then it intersects the line y = 2x at B(1250, 2500)

Accordingly we get the point B(1250, 2500)

Hence the discount = 1250

Manually it can be checked

As marked price is 2500

y = 2500

So x = 2500 ÷ 2 = 1250

22)

1. Table

x	24	12	8	6	4	3	2	1
y	1	2	3	4	6	8	12	24

2. Variation:

Indirect Variation

3. Equation

xy = k

xy = 24 x 1 = 12 x 2 = 8 x 3 =... = 12

xy = 24

4. Points

(24,1),(12,2),(8,3),(6,4)

(4,6),(3,8),(2,12),(1,24)

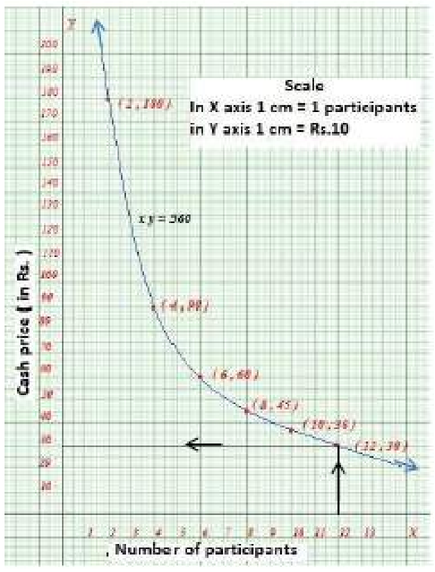
5. Solution

From the graph

(i) If x = 3, then, y = 8

(ii) If y = 6 then, x = 4

23)



1. Table:

No. of participants (x)	2	4	6	8	10
Amount for each participants in Rs. (y)	180	90	60	45	36

2. Variation

Indirect Variation

3. Equation

xy = k

xy = 2 x 180 = 4 x 90 = 6 x 60 =.... = 360

xy = 360

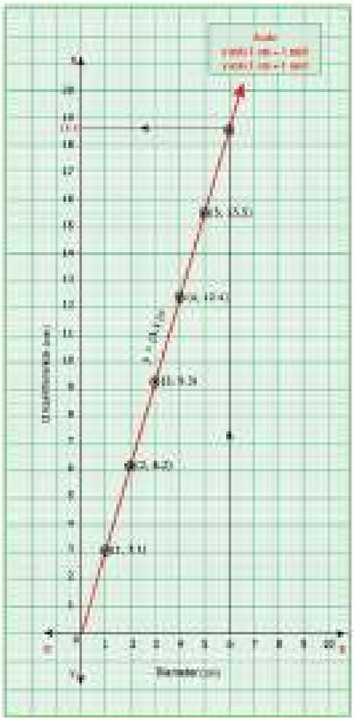
4.Points

(2,180), (4,190),(6,60) (8,45) ,(10,36)

5. Solution

(i) Constant of Variation

(ii) Cash Price each participant will get if 12 participants participate = Rs. 30 /-

24) 

From the table, we found that as x increses, y also increases. Thus, the variation is a direct variation.

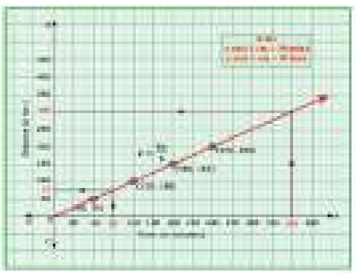
Let y = kx, where k is a constant of proportionality.

From the given values, we have

m SSD/D m cSL/L m fSS/S m DLST/T m m SSD

When you plot the points (1, 3.1) (2, 6.2) (3, 9.3), (4, 12.4), (5, 15.5), you find the relation y = (3.1)x forms a straight-line graph.

Clearly, from the graph, when diameter is 6 cm, its circumference is 18.6 cm.

25) 

Let x be the time taken in minutes and y be the distance travelled in km.

2	3	c=	DL=	De=	LT=
u	2 3	a=	D=	Da=	L=

(i) Observe that as time increases, the distance travelled also increases. Therefore, the variation is a direct variation. It is of the form y = kx .

Constant of variation

m – m a=/c= m D=/DL= m Da=/De= m L=/LT= m a/c

Hence, the relation may be given as

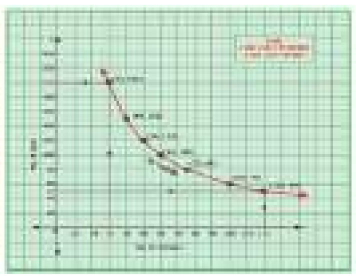
m m a/c

(ii) From the graph, m a/c 6 if x = 90 , then m a/c f =m da

The distance travelled for D D/L hours (i.e.,) 90 minutes is 75 km.

(iii) From the graph, m a/c 6 m S= then m c/a m c/a S=m Sc= minutes (or) 6 hours.

The time taken to cover 300 km is 360 minutes, that is 6 hours.

26) 

From the given table, we observe that as x increases, y decreases. Thus, the variation is an inverse variation.

m –

⇒ xy = k, k > 0 is called the constant of variation

From the table, k = 40 x150 = 50 x 120 = ... = 75 x 80 = 6000

Therefore, xy = 6000

Plot the points (40,150), (50,120), (60,100) of (75,80) and join to get a free hand smooth curve (Rectangular Hyperbola).

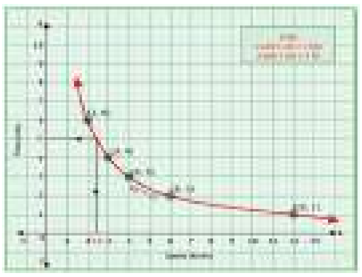
(ii) From the graph, the required number of days to complete the work when the company decides to work with 120 workers is 50 days

Also, from xy = 6000 if x = 120 , then y = c=/DL= m a=

(iii) From the graph, if the work has to be completed by 30 days, the number of workers required is 200.

Also, from xy = 6000 if y = 200 , then m c=/L= m S=

27)



Let us form the table with the given details.

2 9 3	DL	c	T	S	L
2 3	D	L	S	T	c

From the table, we observe that as x decreases, y increases. Hence, the type is inverse variation.

m –

⇒ xy = k, k > 0 is called the constant of variation.

From the table k = 12 x 1 = 6 x 2 = …

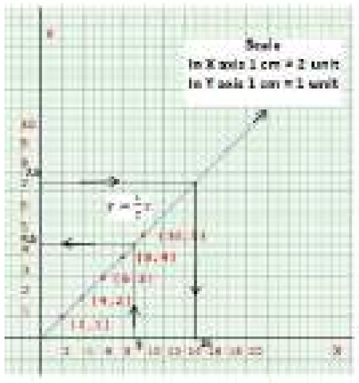
= 2 x 6 = 12

Therefore, xy = 12.

Plot the points (12,1), (6,2), (4,3), (3,4), (2,6) and join these points by a smooth curve (Rectangular Hyperbola).

From the graph, we observe that Kaushik takes 5 hrs with a speed of 2.4 km/hr.

28)



1.Table :

x	2	4	6	8	10
y	1	2	3	4	5

2.Variation :

Direct Variation

3. Equation

y = kx

m – m $\frac{D}{L}$ m $\frac{L}{T}$ m 88$\frac{D}{L}$

m $\frac{D}{L}$

4. Points :

(2,1),(4,2),(6,3),(8,4),(1,5)

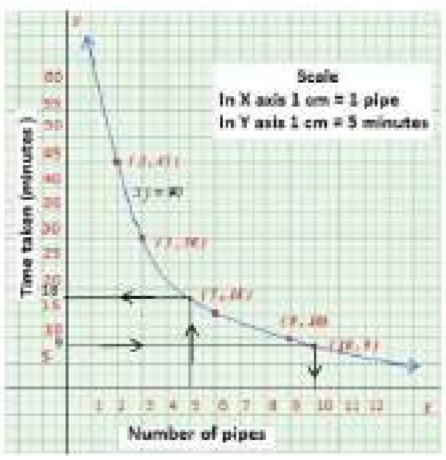
5. Solution

From the graph

(i) If x = 9 then, y = 4.5

(ii) if y = 7.5 then, x = 15

29)



1.Table

No. of pipes (x)	2	3	6	9
Time taken (in minutes) (y)	45	30	15	10

2. Variation

Indirect Variation

3. Equation

xy = k

xy = 2 x 45 = 3 x 30 = 6 x 15 = …. = 90

xy = 90

4. Points

(2, 45),(3, 30),(6, 15),(9, 10)

5. Solution

(i) Time taken to fill the tank if using 5 pipes = 18 minutes

(ii) Number of pipes used if the tank fills up in 9 minutes = 10 pipes

30)

1.Table

Time (in hours) (x)	4	8	12	24
Amount in Rs (y)	60	120	180	360

2.Variation :

Direct Variation

3. Equation

y = 5x

m – m c= T m DL= e m   m Da

4.Points :

(4,60),(8,120),(12,180),(24,320)

5.Solution :

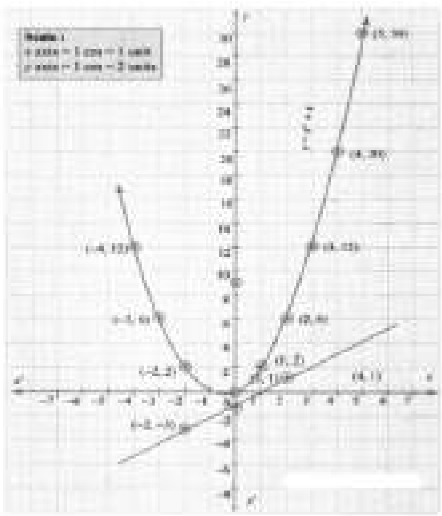
(i). If the parking time is 6 hours , then the parking charge = Rs. 90

(ii). If the amount Rs.150 is paid , then the Parking time = 10 hours

31)

x	-4	-3	-2	-1	0	1	2	3	4	5
x^2	16	9	4	1	0	1	4	9	16	25
+x	-4	-3	-2	-1	0	1	2	3	4	5
$y = x^2 + x$	12	6	2	0	0	2	6	12	20	30

Draw the parabola by the plotting the points (-4, 12), (-3, 6), (-2, 2), (-1, 0), (0, 0), (1, 2), (2, 6), (3, 12), (4, 20), (5, 30)



To solve: $x^2 + 1 = 0$, subtract $x^2 + 1 = 0$ from $y = x^2 + x$.

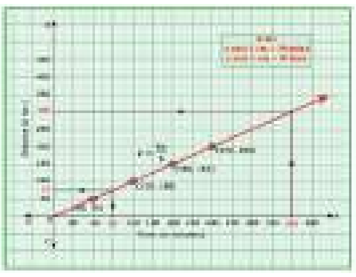
$x^2 + 1 = 0$ from $y = x^2 + x$

$x^2 + 1 = 0$ from $y = x^2 + x$

i.e.
$$\begin{aligned} y &= \cancel{x^2} + x \\ 0 &= \cancel{x^2} + 1 \\ (-)\ &(-)\ \ (-) \\ \hline y &= x - 1 \end{aligned}$$

x	-2	0	2
-1	-1	-1	-1
y	-3	-1	1

Plotting the points (-2, -3), (0, -1), (2, 1) we get a straight line. This line does not intersect the parabola. Therefore there is no real roots for the equation $x^2 + 1 = 0$.

32) 

Let x be the time taken in minutes and y be the distance travelled in km.

	2	3	c=	DL=	De=	LT=
u	2	3	a=	D=	Da=	L=

(i) Observe that as time increases, the distance travelled also increases. Therefore, the variation is a direct variation. It is of the form y = kx .

Constant of variation

m – m $\frac{a=}{c=}$ m $\frac{D=}{DL=}$ m $\frac{Da=}{De=}$ m $\frac{L=}{LT=}$ m $\frac{a}{c}$

Hence, the relation may be given as

m m $\frac{a}{c}$

(ii) From the graph, m $\frac{a}{c}$6if x = 90 , then m $\frac{a}{c}$ f =m da

The distance travelled for D$\frac{D}{L}$hours (i.e.,) 90 minutes is 75 km.

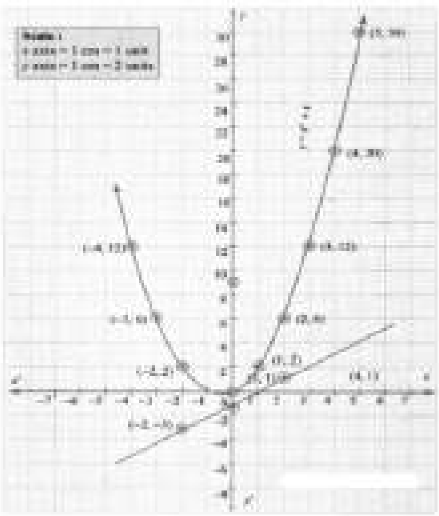
(iii) From the graph, m $\frac{a}{c}$6 m S==then m $\frac{c}{a}$ m $\frac{c}{a}$ S==m Sc=minutes (or) 6 hours.

The time taken to cover 300 km is 360 minutes, that is 6 hours.

33)

x	-4	-3	-2	-1	0	1	2	3	4	5
x^2	16	9	4	1	0	1	4	9	16	25
+x	-4	-3	-2	-1	0	1	2	3	4	5
$y = x^2 + x$	12	6	2	0	0	2	6	12	20	30

Draw the parabola by the plotting the points (-4, 12), (-3, 6), (-2, 2), (-1, 0), (0, 0), (1, 2), (2, 6), (3, 12), (4, 20), (5, 30)



To solve: $x^2 + 1 = 0$, subtract $x^2 + 1 = 0$ from $y = x^2 + x$.

$x^2 + 1 = 0$ from $y = x^2 + x$

$x^2 + 1 = 0$ from $y = x^2 + x$

i.e.

$$\begin{aligned} y &= \cancel{x^2} + x \\ 0 &= \cancel{x^2} + 1 \\ (-)\ & (-)\ \ (-) \\ \hline y &= x - 1 \end{aligned}$$

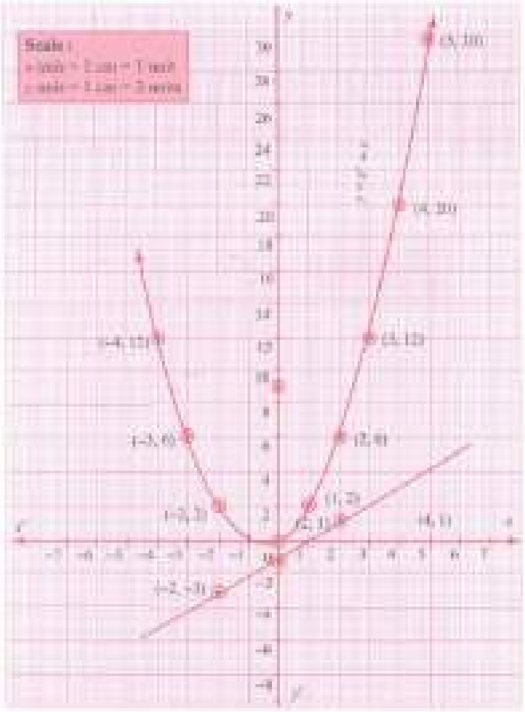
x	-2	0	2
-1	-1	-1	-1
y	-3	-1	1

Plotting the points (-2, -3), (0, -1), (2, 1) we get a straight line. This line does not intersect the parabola. Therefore there is no real roots for the equation $x^2 + 1 = 0$.

34)

x	-4	-3	-2	-1	0	1	2	3	4	5
x^2	16	9	4	1	0	1	4	9	16	25
+x	-4	-3	-2	-1	0	1	2	3	4	5
$y=x^2+x$	12	6	2	0	0	2	6	12	20	30

Draw the parabola by the plotting the points (-4, 12), (-3, 6), (-2, 2), (-1, 0), (0, 0), (1, 2), (2, 6), (3, 12), (4,20), (5, 30)



To solve: $X^2 + 1 = 0$, subtract $X^2 + 1 = 0$ from $y = X^2 + x$.

$x^2 + 1 = 0$ from $y = x^2 + x$

i.e.

$$\begin{array}{rcl} y & = & \cancel{x^2} + x \\ 0 & = & \cancel{x^2} + 1 \\ (-) & (-) & (-) \\ \hline y & = & x - 1 \end{array}$$

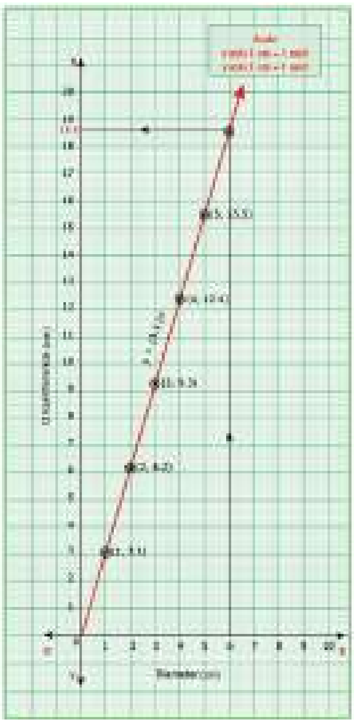
This is a straight line.

Draw the line y = x - 1.

x	-2	0	2
-1	-1	-1	-1
y	-3	-1	1

Plotting the points (-2, -3), (0, -1), (2, 1) we get a straight line. This line does not intersect the parabola. Therefore there is no real roots for the equation $X^2 + 1 = 0$.

35)



From the table, we found that as x increses, y also increases. Thus, the variation is a direct variation.

Let y = kx, where k is a constant of proportionality.

From the given values, we have

m $\frac{S8D}{D}$ m $\frac{c8L}{L}$ m $\frac{f8S}{S}$ m $\frac{IL8T}{T}$ m m S8D

When you plot the points (1, 3.1) (2, 6.2) (3, 9.3), (4, 12.4), (5, 15.5), you find the relation y = (3.1)x forms a straight-line graph.

Clearly, from the graph, when diameter is 6 cm, its circumference is 18.6 cm.