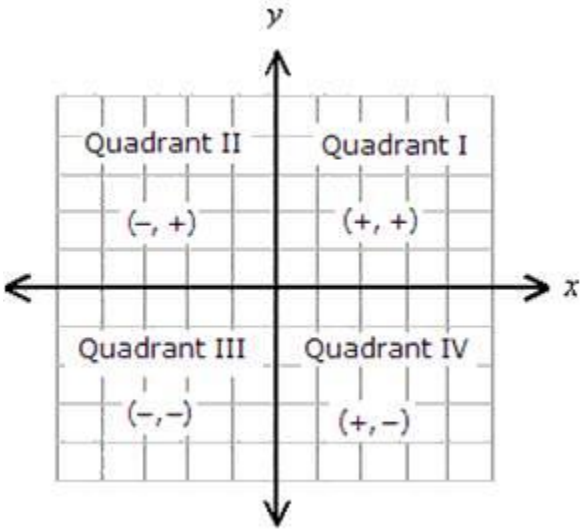
Co-ordinate Geometry

Practice set 7.1

Q. 1. State in which quadrant or on which axis do the following points lie.

A(-3, 2), B(-5, -2), K(3.5, 1.5),
D(2, 10), E(37, 35), F(15, -18),
G(3, -7), H(0, -5), M(12, 0),
N(0, 9), P(0, 2.5), Q(-7, -3)

Answer : The x-y coordinate system is shown below:



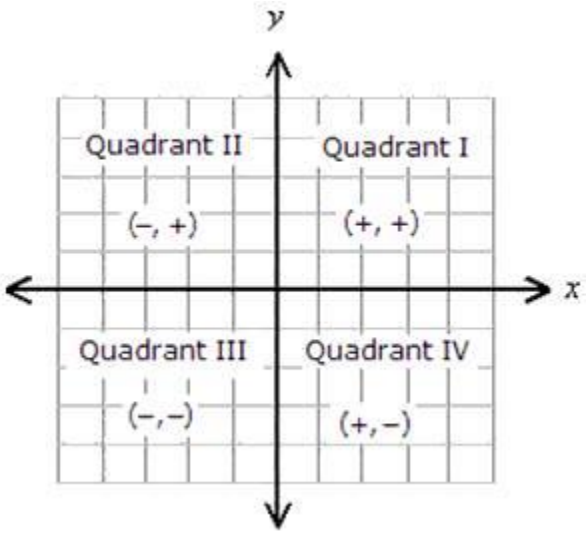
The points are calculated as below:

S.No.	Point	x co-ordinate	y co-ordinate	Quadrant/Axis
1.	A(-3,2)	negative	positive	II
2.	B(-5,-2)	negative	negative	III
3.	K(3.5,1.5)	positive	positive	I
4.	D(2,10)	positive	positive	I
5.	E(37,35)	positive	positive	I
6.	F(15,-18)	positive	negative	IV
7.	G(3,-7)	positive	negative	IV
8.	H(0,-5)	0	negative	y-axis
9.	M(12,0)	positive	0	x-axis
10.	N(0,9)	0	positive	y-axis
11.	P(0,2.5)	0	positive	y-axis
12.	Q(-7,-3)	negative	negative	III

Q. 2. In which quadrant are the following points?

i. whose both co-ordinates are positive.
ii. whose both co-ordinates are negative.
iii. whose x co-ordinate is positive, and the y co-ordinate is negative.
iv. whose x co-ordinate is negative and y co-ordinate is positive.

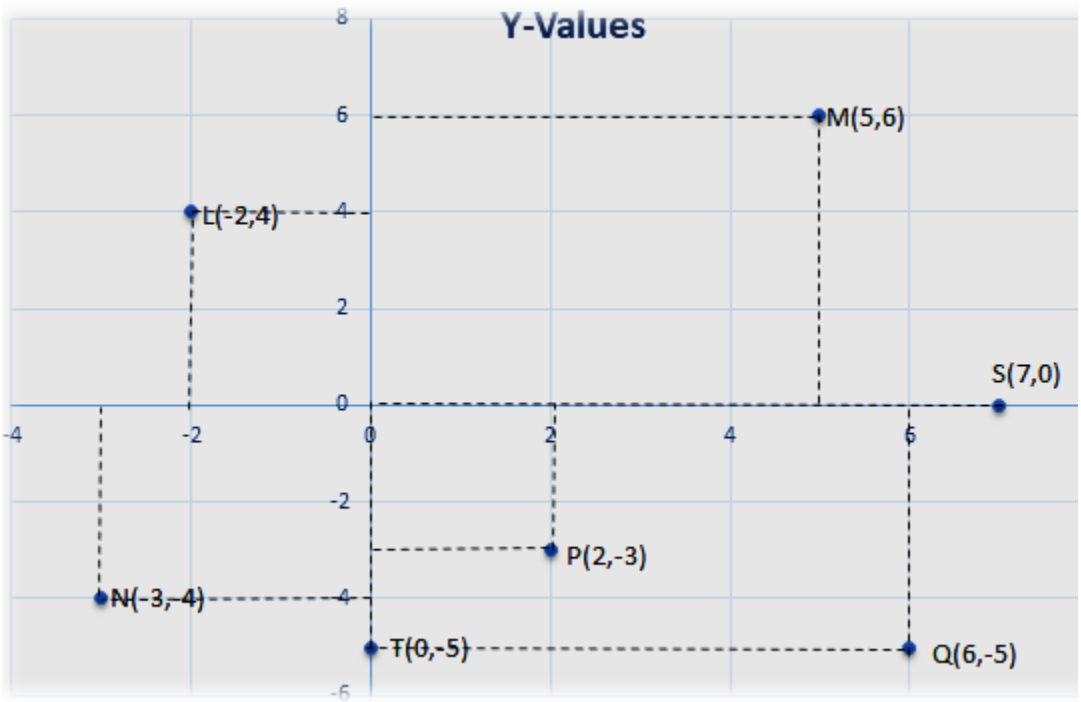
Answer : According to co-ordinates Geometry,
i. In First Quadrant, both co-ordinates are positive.
ii. In Third Quadrant, both co-ordinates are negative.
iii. In Fourth Quadrant, x co-ordinate is positive and the y co-ordinate is negative.
iv. In second Quadrant, x co-ordinate is negative and y co-ordinate is positive.
The coordinate-system is shown below:



Q. 3. Draw the co-ordinate system on a plane and plot the following points.

L(-2, 4), M(5, 6), N(-3, -4), P(2, -3), Q(6, -5), S(7, 0), T(0, -5)

Answer : The graph is shown below:



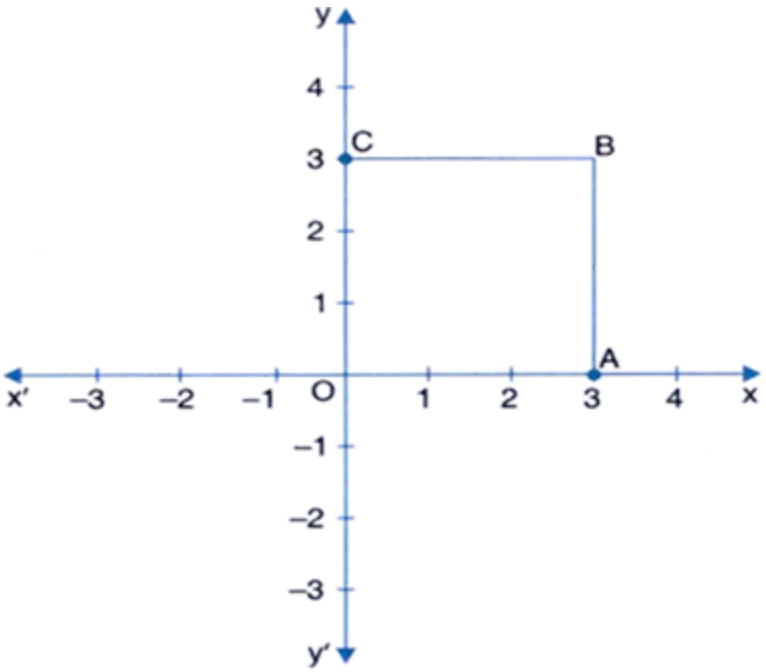
Steps for plotting the points:

- Draw X-axis and Y-axis on the plane.
- To find the point M(5,6) draw a line parallel to the Y-axis through the point on X axis which represents the number 5. Through the point on Y-axis which represents the number 6 draw a line parallel to the X-axis .
- The point of intersection of these two lines parallel to the Y and X-axis respectively, is the point M(5,6).
- In the same way, plot the point Q (6,-5),P(2,-3),L(-2,4) and N(-3,-4).
- and the point S(7,0) is lies on X-axis and the point T(0,-5) lies on Y-axis.

Practice set 7.2

Q. 1. On a graph paper plot the points A (3,0), B(3,3), C(0,3). Join A, B and B, C. What is the figure formed?

Answer : The graph is shown below:



Steps are given below:

• O is a centre of XY planes.

• Firstly we have drawn a point A(3,0) which is lies on x-axis and then,

• To find the point B(3,3) draw a line parallel to the Y-axis through the point on X axis which represents the number 3. Through the point on Y-axis which represents the number 3 draw a line parallel to the X-axis .

• And then draw a point C(0,3) is lies on y-axis and,

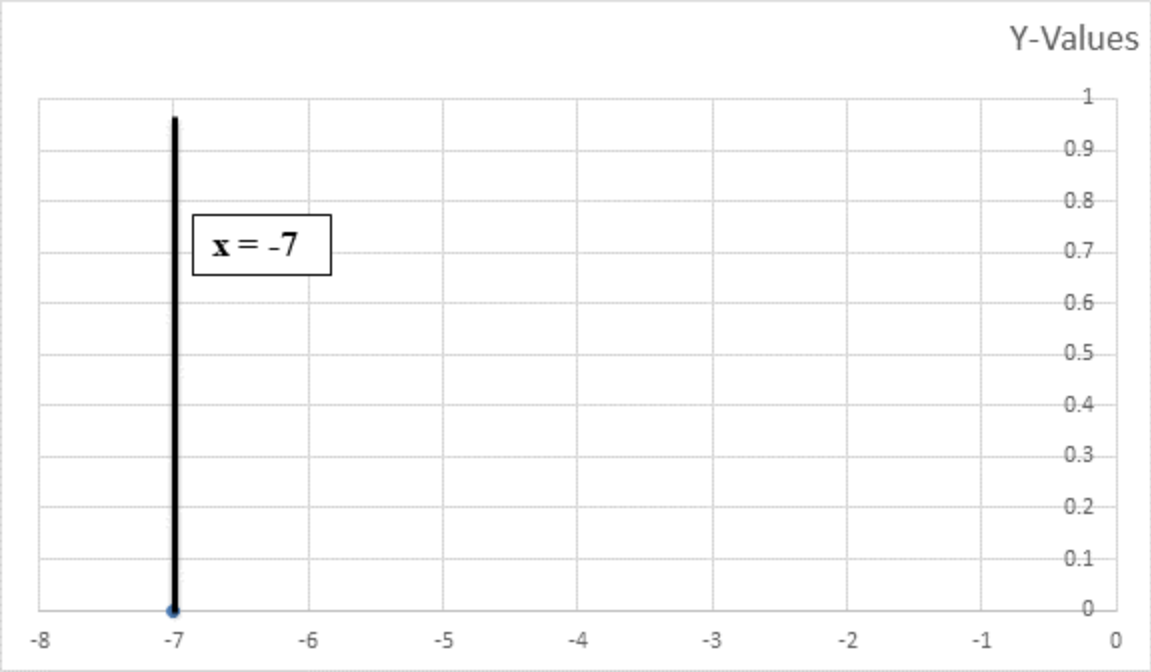
• Joining a points A,B,C and O then it is formed a SQUARE.

Q. 2. Write the equation of the line parallel to the Y-axis at a distance of 7 units from it to its left.

Answer : The equation of line parallel to Y-axis is x = a

$\therefore$ a = -7 (because 7 units from left)

$\Rightarrow$ x = -7 is required equation.



X-Values

Steps to draw:

• On a graph paper draw the X-axis and the Y-axis.

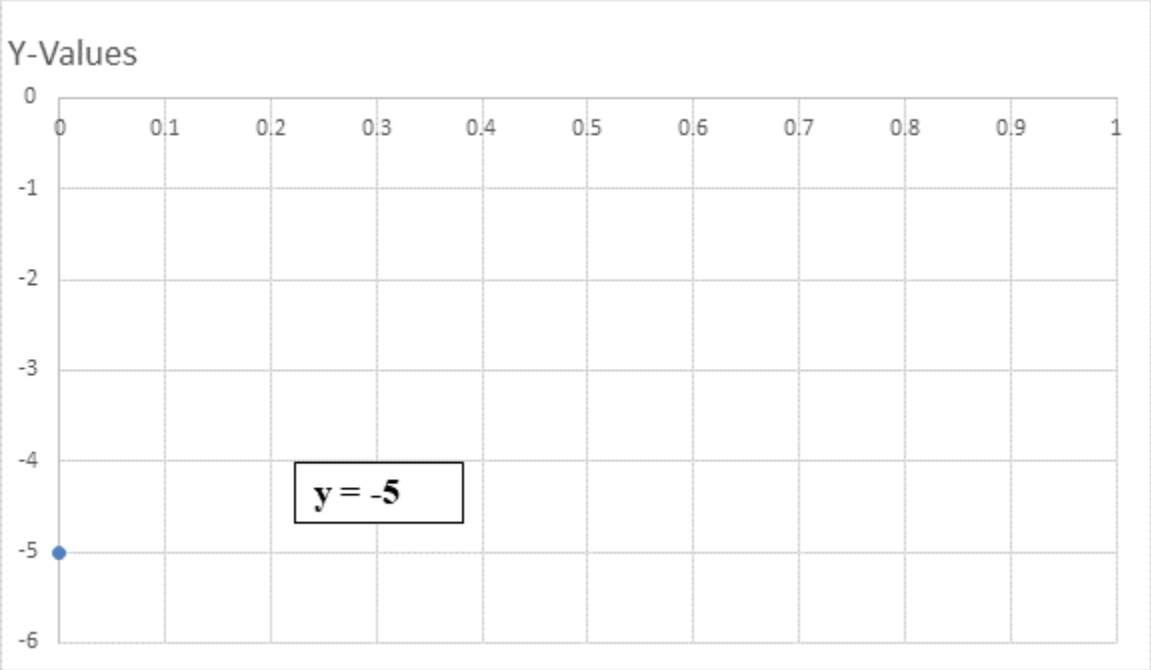
• Since it is given that x = -7, draw a line on the left of the Y-axis at a distance of 7 units from it and parallel to it.

Q. 3. Write the equation of the line parallel to the X-axis at a distance of 5 units from it and below the X-axis.

Answer : The equation of line parallel to X-axis is y = a

$\therefore$ a = -5 (because 5 units below the x-axis)

$\Rightarrow$ y = -5 is required equation.



Steps:

• On a graph paper draw the X-axis and the Y-axis.

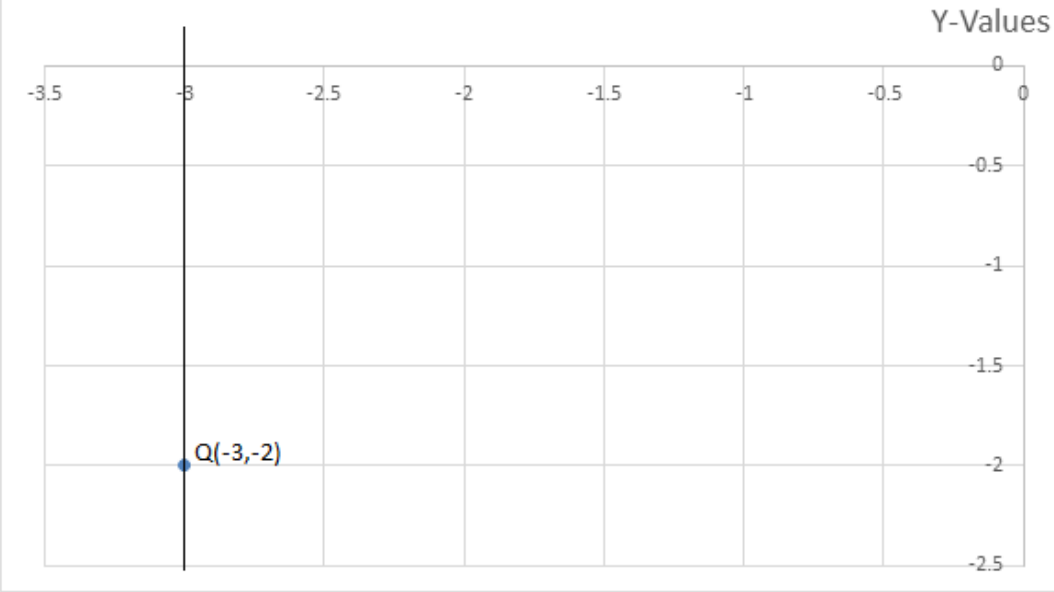
• Since it is given that y = -5, draw a line below the X-axis at a distance of 5 units from it and parallel to it.

Q. 4. The point Q(-3, -2) lies on a line parallel to the Y-axis. Write the equation of the line and draw its graph.

Answer : The equation of line parallel to y-axis is x = a

$\therefore$ x = -3

And the given point is Q(-3,-2)



Q. 5. Y-axis and line x = -4 are parallel lines. What is the distance between them?

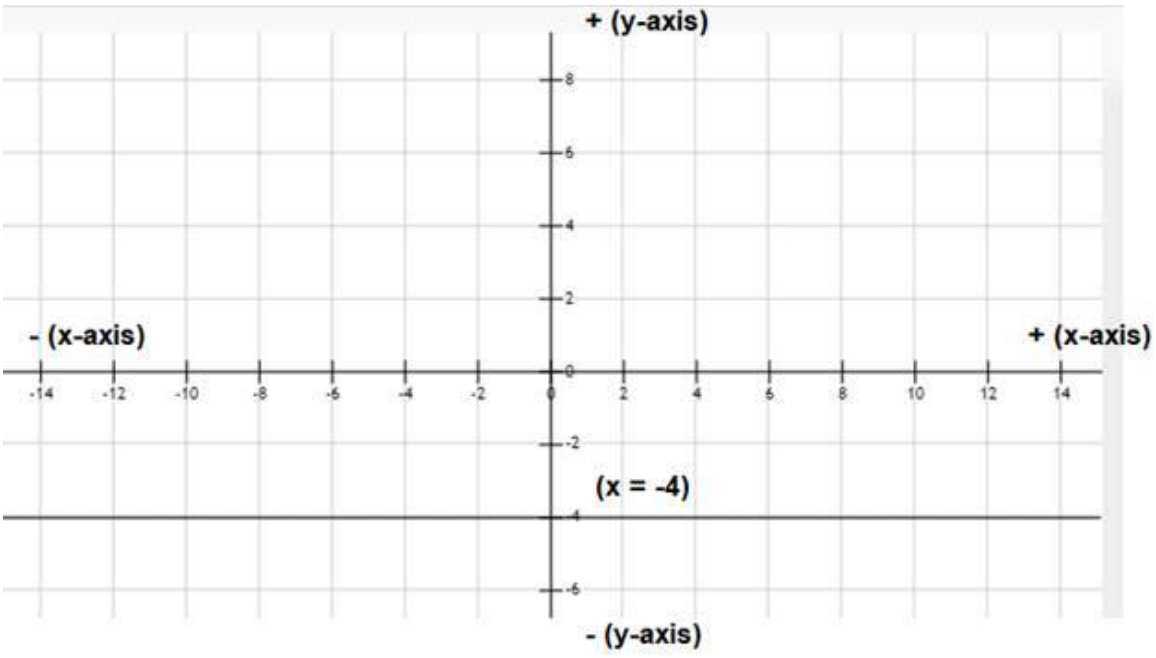
Answer : The equation of line parallel to Y-axis is x = a.

$\Rightarrow$ x = -4

$\therefore$ a = -4

Since the distance between and the line is 4 units.

The graph is shown below:



Q. 6. Which of the equations given below have graphs parallel to the X-axis, and which ones have graphs parallel to the Y-axis?

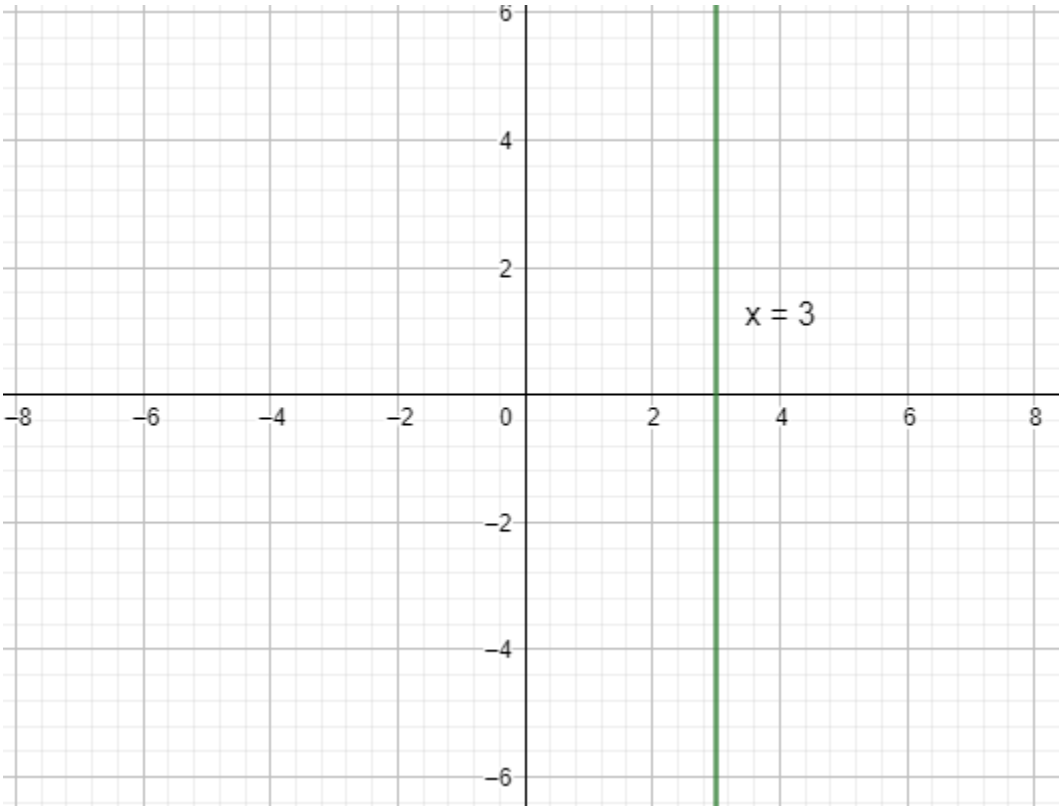
i. x=3 ii. y – 2 = 0
iii. x + 6 = 0 iv. Y = -5

Answer : i. x = 3

∴ x = a

⇒ The line is parallel to y-axis.

The figure is shown below:

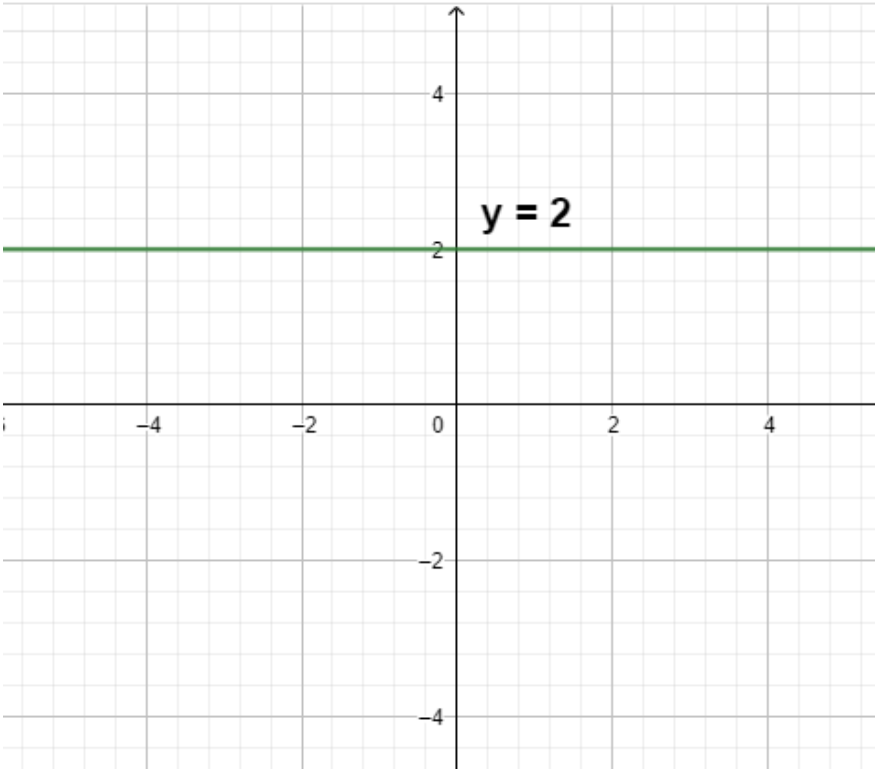


ii. y-2 = 0

∴ y = 2

⇒ y = a

The figure is shown below:

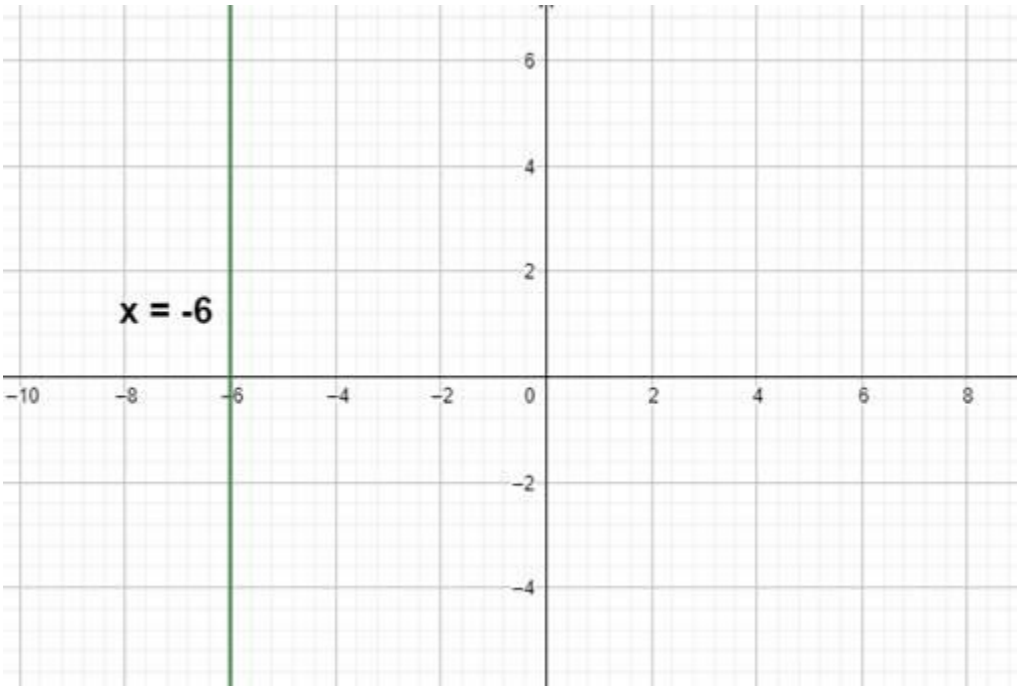


And the line is parallel to x-axis.

iii. x + 6 = 0

∴ x = -6

The figure is shown below:



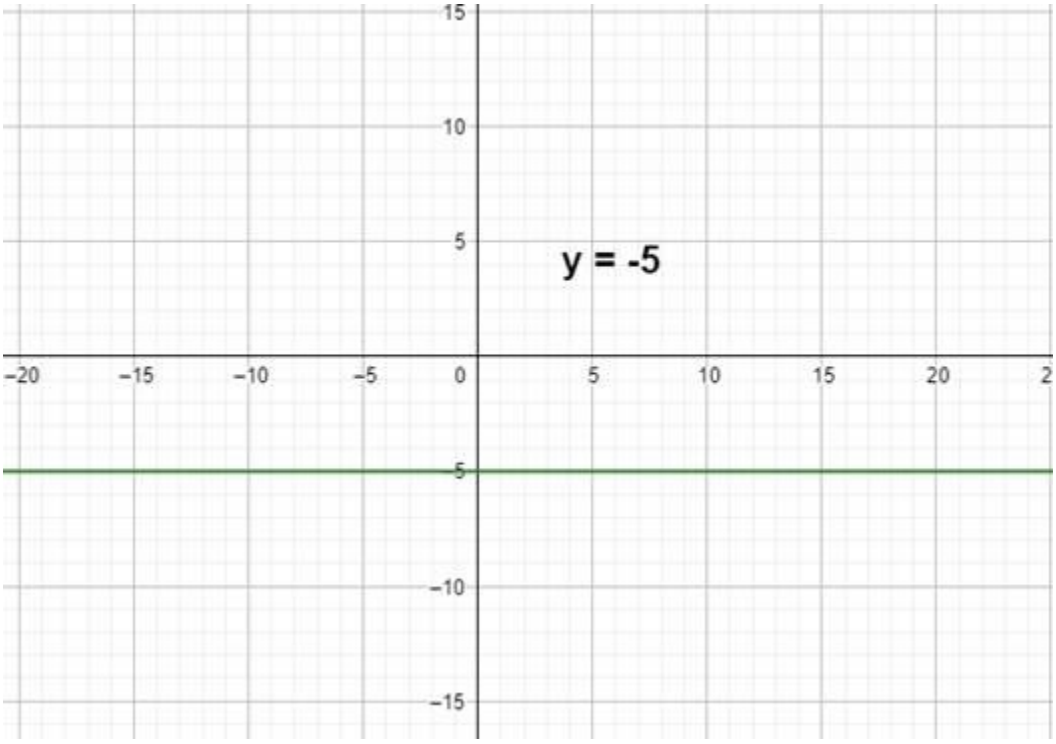
And the line is parallel to y-axis.

iv. y = -5

$\Rightarrow$ y = a

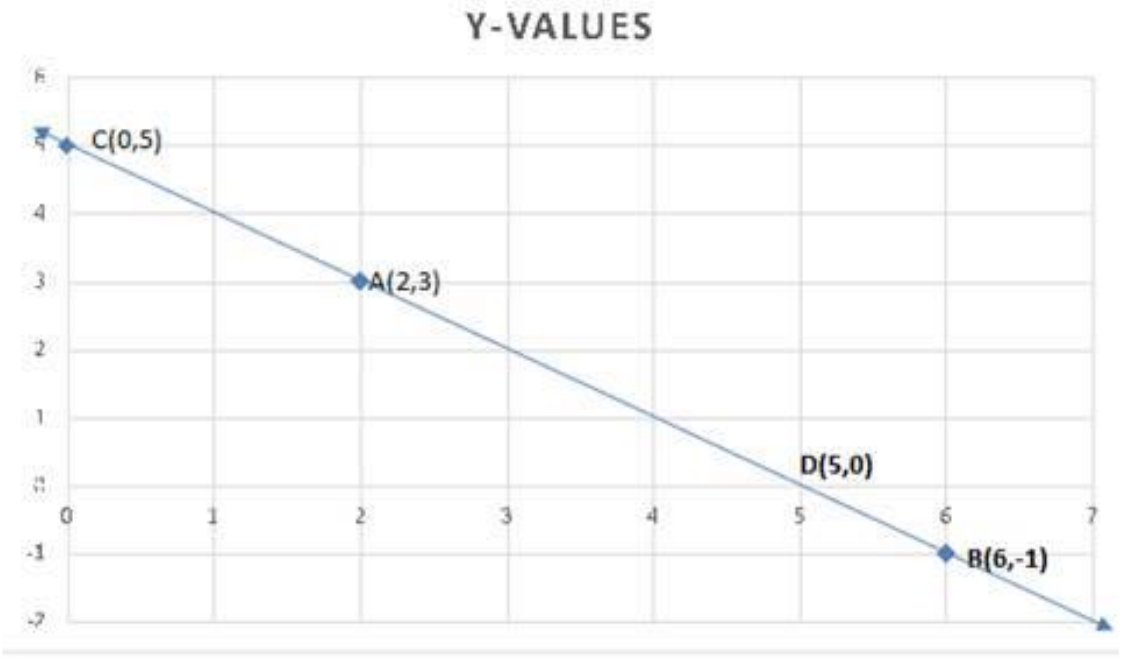
Then, the line is parallel to x-axis.

The figure is shown below:



Q. 7. On a graph paper, plot the points A(2, 3), B(6, -1) and C(0, 5). If those points are collinear then draw the line which includes them. Write the co-ordinates of the points at which the line intersects the X-axis and the Y-axis.

Answer : The figure is shown below:



• Yes, given points are collinear.

• The line intersects the x-axis at point D(5,0) and the y-axis at point C(0,5).

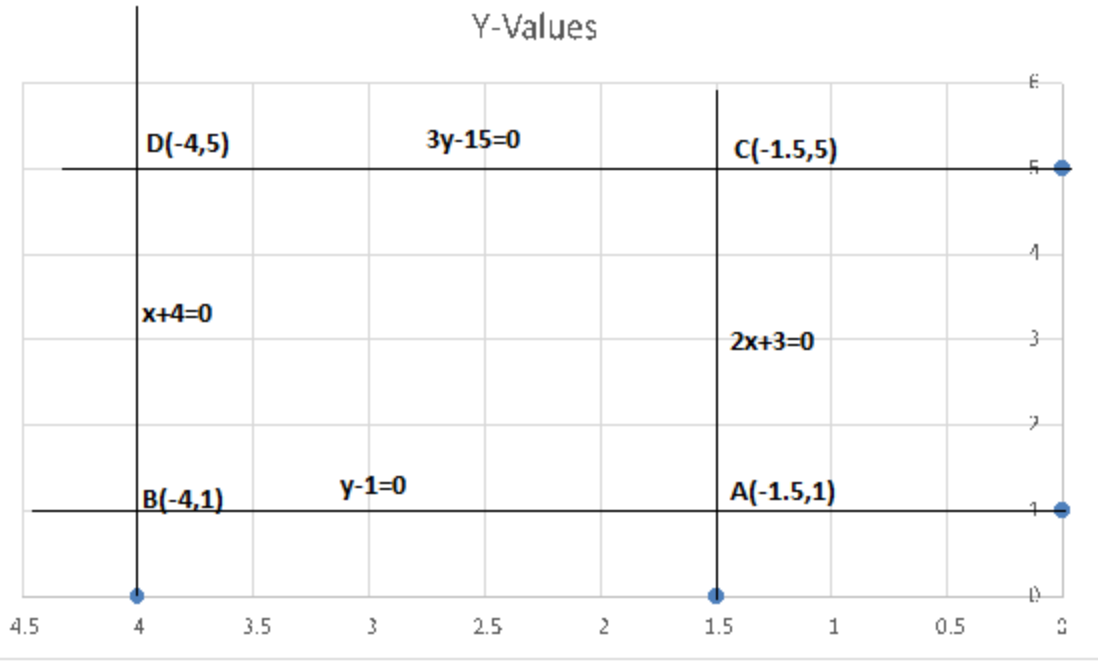
Q. 8. Draw the graphs of the following equations on the same system of co-ordinates. Write the co-ordinates of their points of intersection.

x + 4 = 0
y - 1 = 0
2x + 3 = 0
3y - 15 = 0

Answer : Given equation are

x + 4 = 0	$\Rightarrow x = -4$
y - 1 = 0	$\Rightarrow y = +1$
2x + 3 = 0	$\Rightarrow x = -\frac{3}{2}$
3y - 15 = 0	$\Rightarrow y = 5$

The figure is shown below:



• On a graph paper draw the X-axis and the Y-axis.

• Since it is given that x = -4 and x = -1.5, draw a line on the left of the Y-axis at a distance of 4 and 1.5 units from it and parallel to it.

• Since it is given that y = 1 and y = 5, draw a line above the X-axis at a distance of 1and 5 units from it and parallel to it.

• These lines, parallel to the two axes, are the graphs of the given equations.

• And these lines are intersects at the point A(-1.5,1), B(-4,1),C(-1.5,5) and D(-4,5).

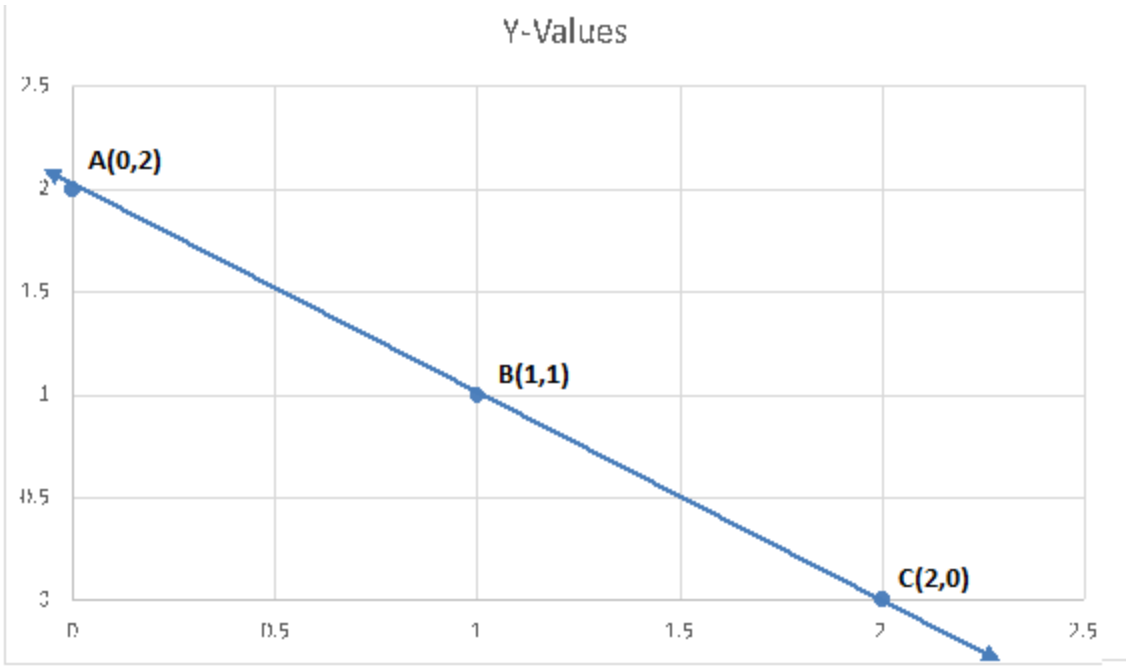
Q. 9 A. Draw the graphs of the equations given below

x + y = 2

Answer: x + y = 2

According to the equation,

x	0	2	1
y	2	0	1
(x, y)	(0,2)	(2,0)	(1,1)



• Firstly we have findout the point with the help of given equation.

• Then after plot a xy plane in a coordinate axis.

• The points A,B and C are collinear because all the points lies in the straight line.

Q. 9 B. Draw the graphs of the equations given below

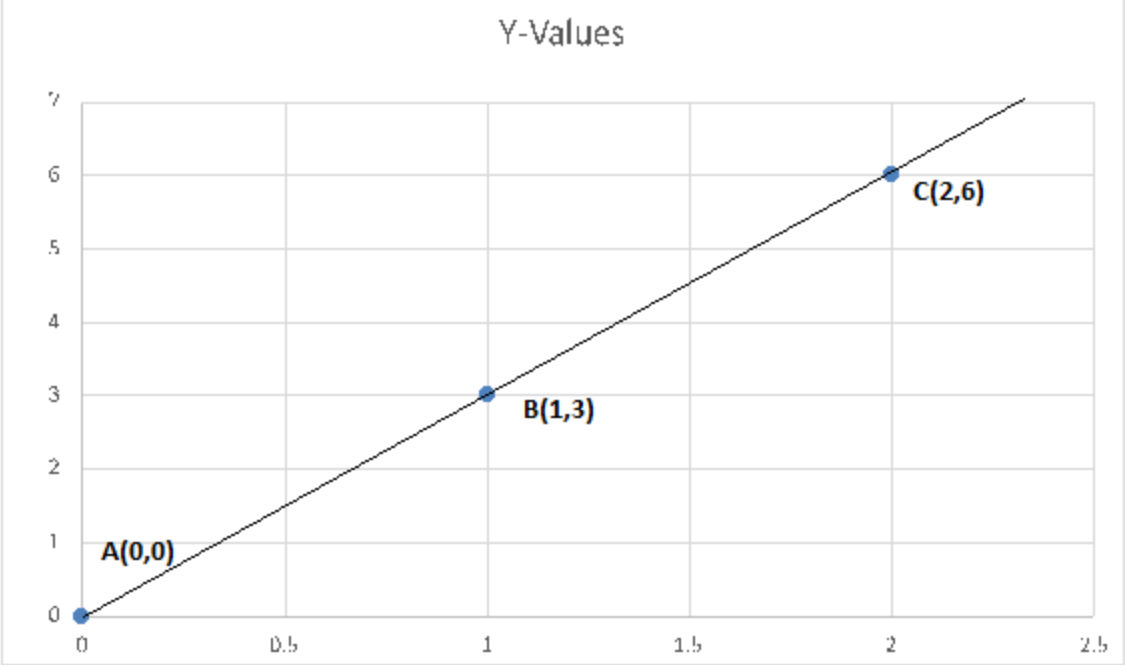
3x-y = 0

Answer : 3x-y = 0

According to the given equation,

Now we have find out the points are

x	0	1	2
y	0	3	6
(x, y)	(0,0)	(1,3)	(2,6)



• On a graph paper draw the X-axis and the Y-axis.

• Then the points A,B and c are collinear because its lies in a straight line.

Q. 9 C. Draw the graphs of the equations given below

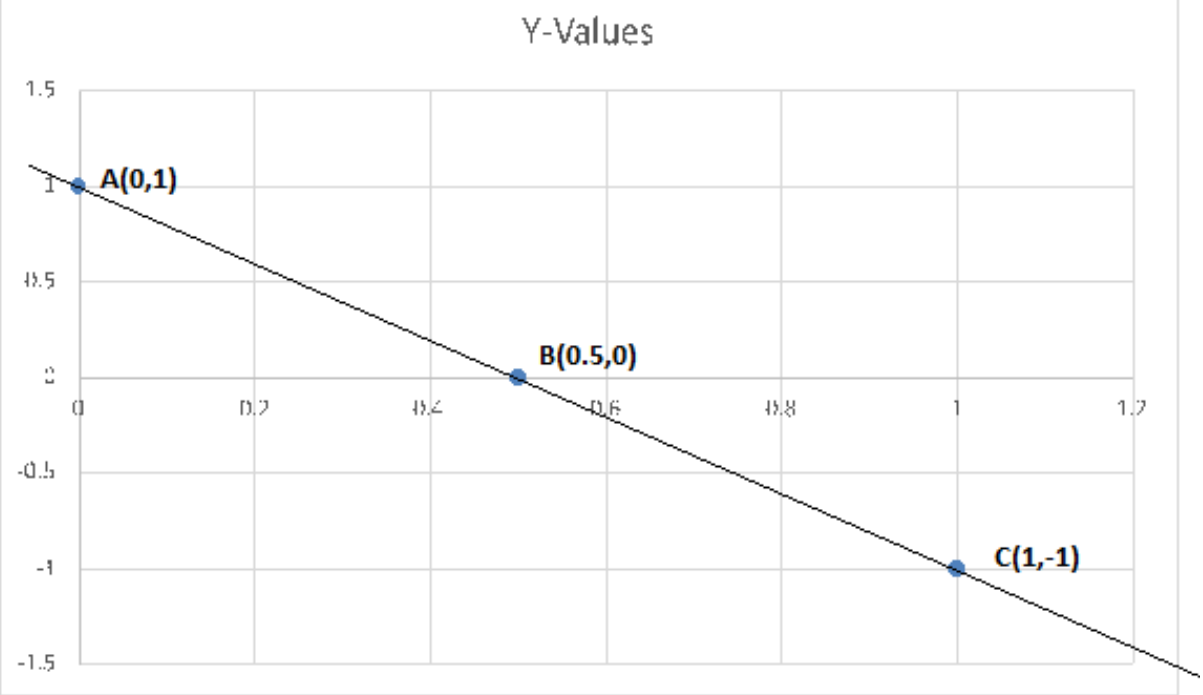
3x-y = 0

Answer : 2x + y = 1

According to the given equation,

Now we have find out the points are

x	0	$\frac{1}{2}$ = 0.5	1
y	1	0	-1
(x, y)	(0,1)	(0.5,0)	(1, -1)



• On a graph paper draw the X-axis and the Y-axis.

• Then the points A,B and c are collinear because its lies in a straight line.

Problem set 7

Q. 1 A. Choose the correct alternative answer for the following questions.

What is the form of co-ordinates of a point on the X-axis?

A. (b,b)
B. (o,b)
C. (a,o)
D. (a,a)

Answer : This is because the y co-ordinate point is zero.

Q. 1 B. Choose the correct alternative answer for the following questions.

Any point on the line y=x is of the form .....

A. (a,a)
B. (o,a)
C. (a,o)
D. (a,-a)

Answer :

$\therefore$ y = x

Y = a then x = a.

Q. 1 C. Choose the correct alternative answer for the following questions.

What is the equation of the X-axis?

A. x =0
B. y =0
C. x+y=0
D. x=y

Answer :

y = m × x + c

Where c is the intercept of the line on y-axis and m is the gradient of the line. Since intercept of x-axis on y-axis is zero, so c = 0. Gradient of x-axis is also zero because it makes an angle zero with itself. So m = tan(theta) = 0. Putting these values in the general equation we get,

y = 0 × x + 0

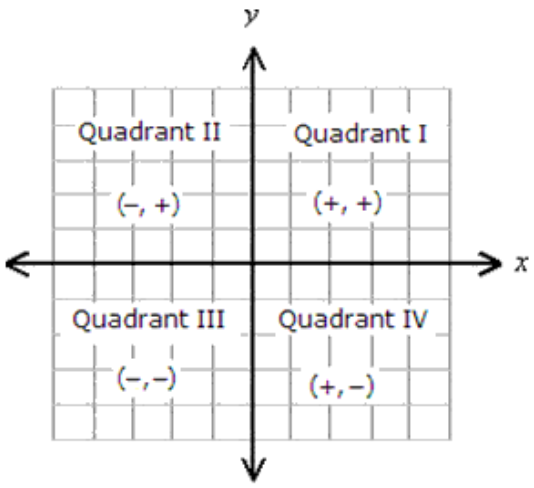
y = 0. Thus we get the equation for x-axis as y = 0.

Q. 1 D. Choose the correct alternative answer for the following questions.

In which quadrant does the point
(-4, -3) lie?

A. First
B. Second
C. Third
D. Fourth

Answer : Since both the x & y coordinate are negative. Hence, it lies in the third quadrant.

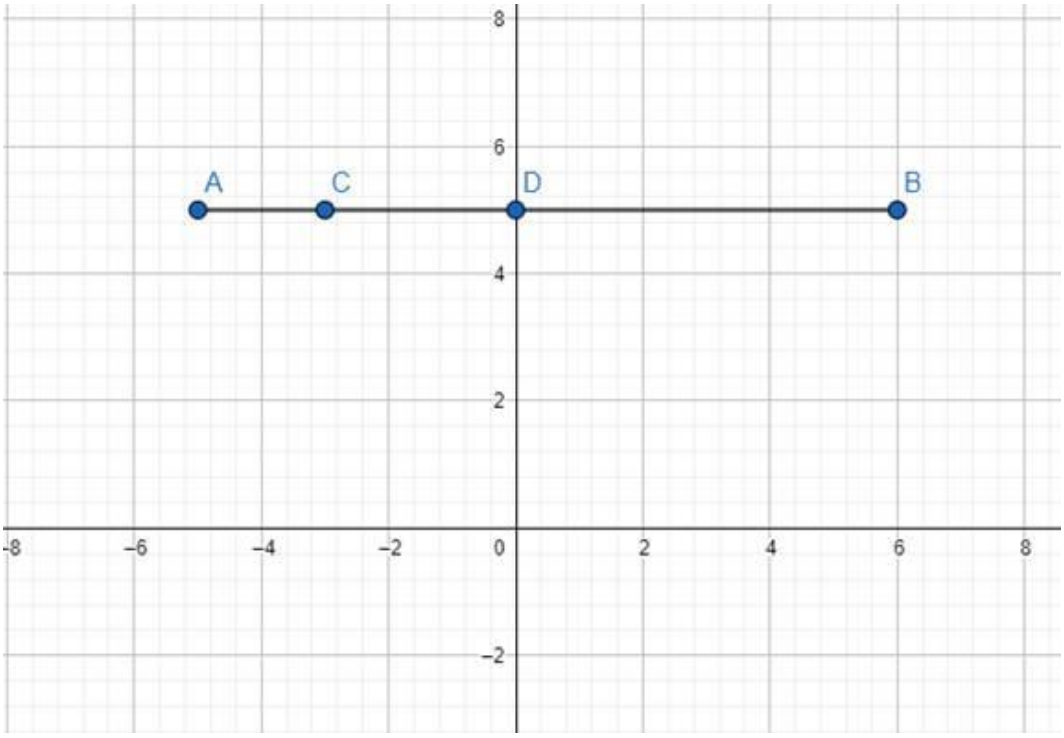


Q. 1 E. Choose the correct alternative answer for the following questions.

What is the nature of the line which includes the points (-5,5), (6,5), (-3,5), (0,5)?

A. Passes through the origin,
B. Parallel to Y-axis.
C. Parallel to X-axis
D. None of these

Answer : All the points are shown below:

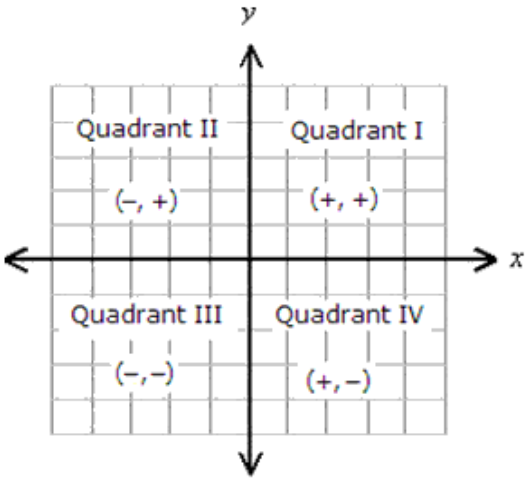


Q. 1 F. Choose the correct alternative answer for the following questions.

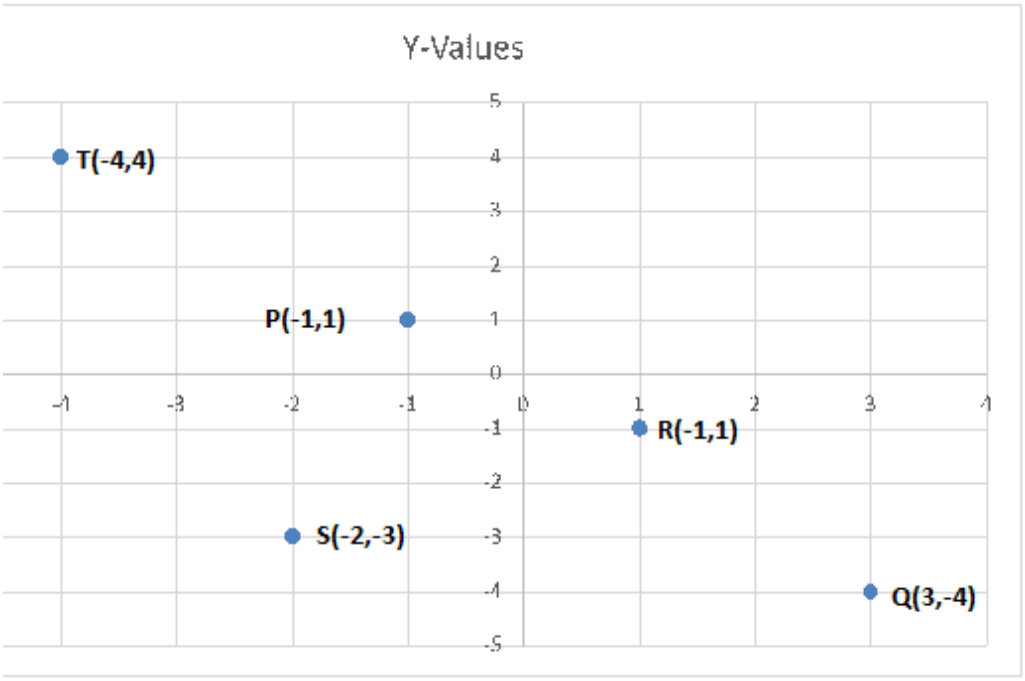
Which of the points P (-1,1), Q (3,-4), R(1,-1), S (-2,-3), T (-4,4) lie in the fourth quadrant?

A. P and T
B. Q and R
C. only S
D. P and R

Answer : For a point to lie in the 4th quadrant, the x-coordinate should be positive & the y-coordinate should be negative.
As shown in the figure:



The figure is given below:



Q. 2. Some points are shown in the figure 7.11

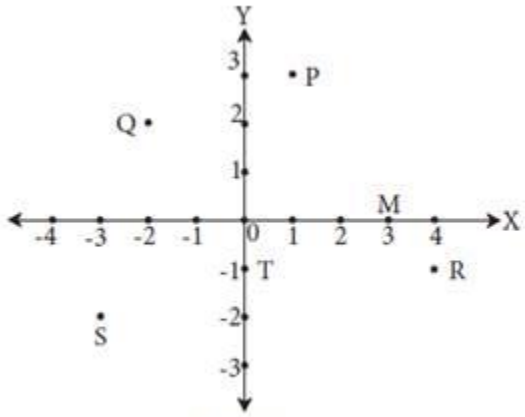


Fig.7.11

With the help of it answer the following questions :

i. Write the co-ordinates of the points Q and R.
ii. Write the co-ordinates of the points T and M.
iii. Which point lies in the third quadrant?
iv. Which are the points whose x and y co-ordinates are equal?

Answer : i. The co-ordinates of the points are Q(-2,2) and R(4,-1).

ii. The co-ordinates of the points are T(0,-1) and M(3,0).

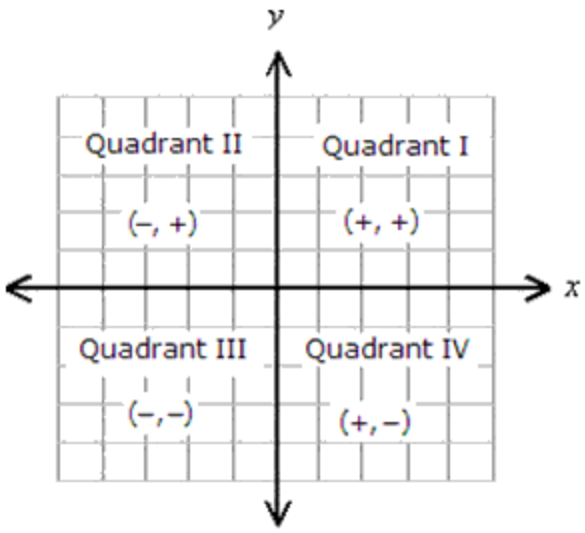
iii. The point lies in the third quadrant is S(-3,-2).

iv. Q(-2,2) (both the co-ordinates are equal)

Q. 3. Without plotting the points on a graph, state in which quadrant or on which axis do the following point lie.

i. (5, -3) **ii. (-7, -12)**
iii. (-23, 4) **iv. (-9, 5)**
v. (0, -3) **vi. (-6, 0)**

Answer : We should plot the points according to the coordinate system:

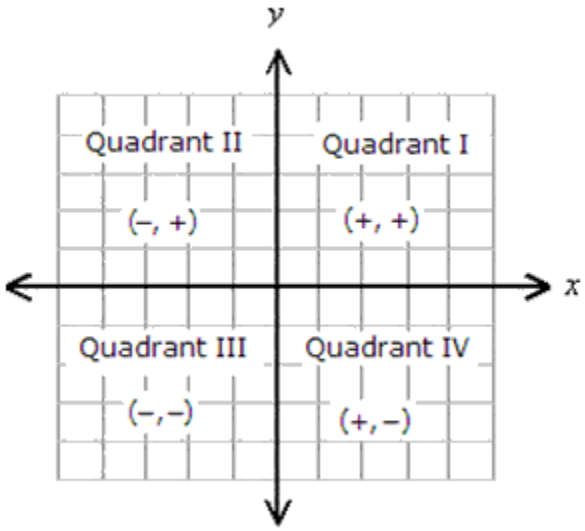


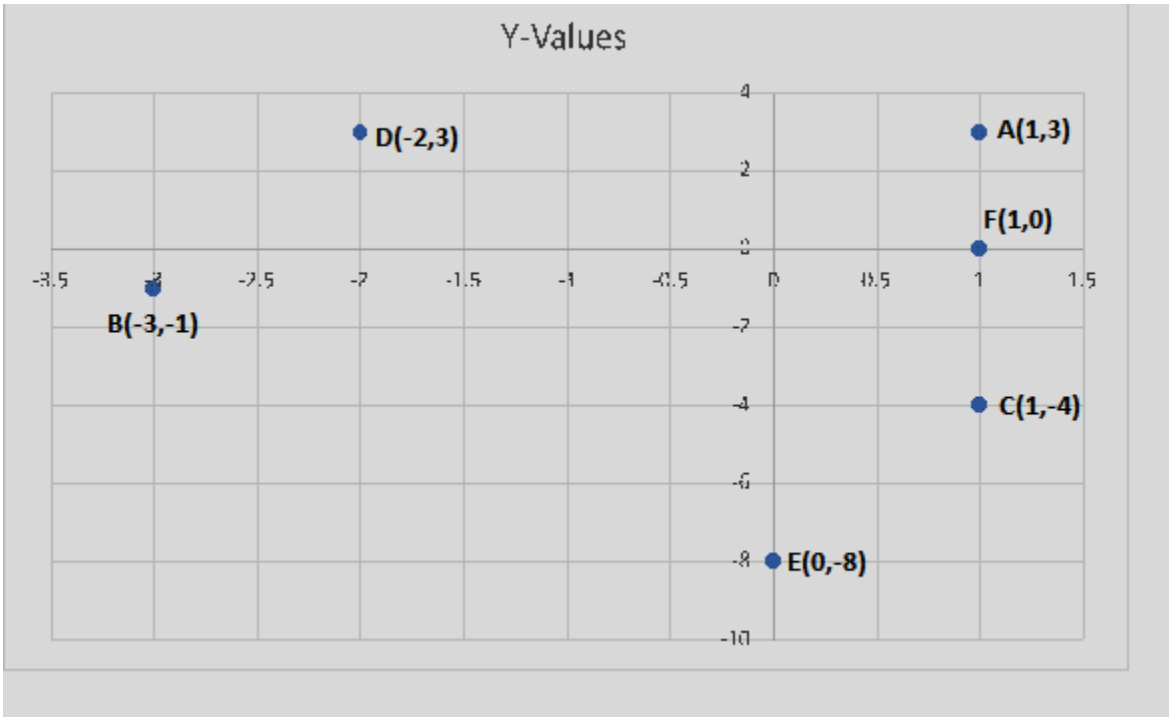
Points	Quadrant
(5,-3)	4th
(-7,-12)	3rd
(-23,4)	2nd
(-9,5)	2nd
(0,-3)	4th
(-6,0)	2nd

Q. 4. Plot the following points on the one and the same co-ordinate system.

A(1, 3), B(-3, -1), C(1, -4), D(-2, 3), E(0, -8), F(1, 0)

Answer : We plot according to the coordinate system:





Q. 5. In the graph alongside, line LM is parallel to the Y-axis. (Fig. 7.12)

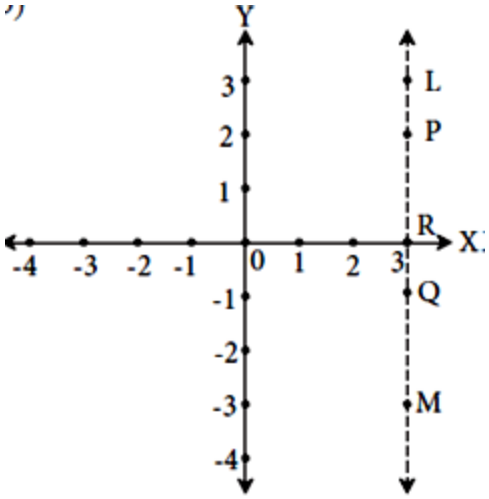


Fig.7.12

i. What is the distance of line LM from the Y-axis?
ii. Write the co-ordinates of the points P, Q and R.
iii. What is the difference between the x co-ordinates of the points L and M?

Answer : i. The distance of line LM from the Y-axis is 3.

ii. The co-ordinates of the points are P(3,2),Q(3,-1)and R(3,0).

iii. The difference between the x co-ordinates of the points L and M is 6.

Q. 6. How many lines are there which are parallel to X-axis and having a distance 5 units?

Answer : Suppose the required linear equation of a line is y = mx + c

Since, the line is parallel to x-axis, so m = 0

Then equation of the line will be y = c

And this line passes through the point at a distance of 5 units below the x-axis i.e (-5,0)

Then the equation of line is y = -5.

And similarly,

And this line passes through the point at a distance of 5 units above the x-axis i.e (5,0)

Then the equation of line is y = 5.

Q. 7. If ‘a’ is a real number, what is the distance between the Y-axis and the line x = a?

Answer : The distance is *a* unit, assuming *a* is an arbitrary constant, which it is, given that you stated it’s a real number.

This is because the y-axis is the same as the line $x = 0$, and so the difference between the two lines will be $a-0$ units, or simply *a* units.