Chapter 26. Co-ordinate Geometry

Exercise 26(A)

Solution 1:

(i) $y = \frac{4}{3}x - 7$

Dependent variable is y

Independent variable is x

(ii) $x = 9y + 4$

Dependent variable is x

Independent variable is y

(iii) $x = \frac{5y+3}{2}$

Dependent variable is x

Independent variable is y

(iv) $y = \frac{1}{7}(6x+5)$

Dependent variable is y

Independent variable is x

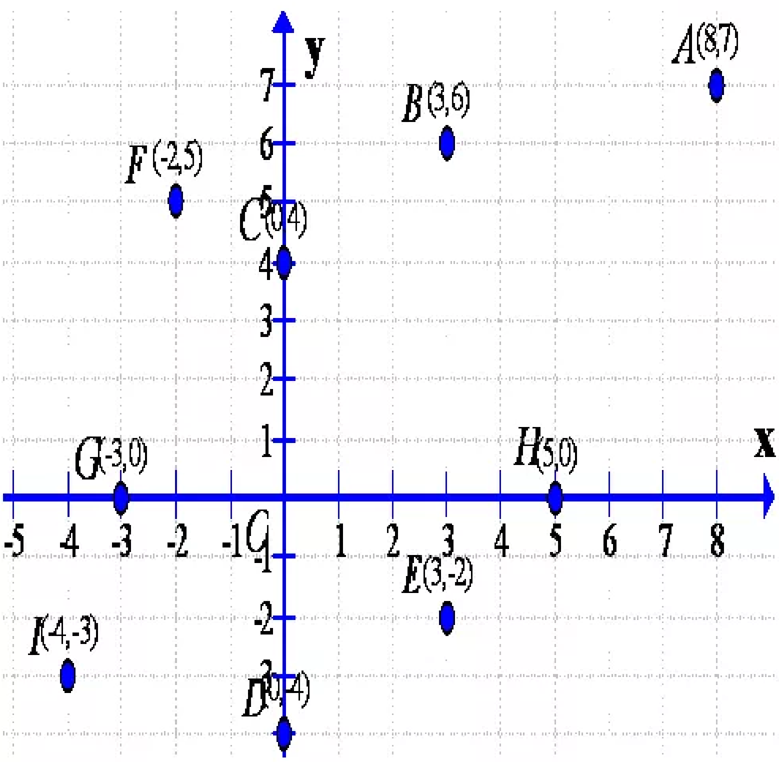
Solution 2:

Let us take the point as

$A(8,7)$, $B(3,6)$, $C(0,4)$, $D(0,-4)$, $E(3,-2)$, $F(-2,5)$, $G(-3,0)$, $H(5,0)$, $I(-4,-3)$

On the graph paper, let us draw the co-ordinate axes XOX' and YOY' intersecting at the origin O. With proper scale, mark the numbers on the two co-ordinate axes.
Now for the point A(8,7)
Step I
Starting from origin O, move 8 units along the positive direction of X axis, to the right of the origin O
Step II
Now from there, move 7 units up and place a dot at the point reached. Label this point as A(8,7)

Similarly plotting the other points
$B(3,6)$, $C(0,4)$, $D(0,-4)$, $E(3,-2)$, $F(-2,5)$, $G(-3,0)$, $H(5,0)$, $I(-4,-3)$



Solution 3:

Two ordered pairs are equal.

$\Rightarrow$ Therefore their first components are equal and their second components too are separately equal.

(i) $(x-1, y+3) = (4,4)$

$$(x-1, y+3) = (4,4)$$
$$x-1 = 4 \text{ and } y+3 = 4$$
$$x = 5 \text{ and } \quad y = 1$$

(ii) $(3x+1, 2y-7) = (9,-9)$

$$(3x+1, 2y-7) = (9,-9)$$
$$3x+1 = 9 \text{ and } 2y-7 = -9$$
$$3x = 8 \text{ and } \quad 2y = -2$$
$$x = \frac{8}{3} \text{ and } \quad y = -1$$

(iii) $(5x-3y, y-3x) = (4,-4)$

$$(5x-3y, y-3x) = (4,-4)$$
$$5x-3y = 4 \ldots\ldots (A) \text{ and } y-3x = -4 \ldots\ldots (B)$$

Now multiplying the equation (B) by 3, we get

$$3y-9x = -12 \ldots\ldots (C)$$

Now adding both the equations (A) and (C), we get

$$(5x-3y)+(3y-9x) = (4+(-12))$$
$$-4x = -8$$
$$x = 2$$

Putting the value of x in the equation (B), we get

$$y - 3x = -4$$
$$\Rightarrow y = 3x - 4$$
$$\Rightarrow y = 3(2) - 4$$
$$\Rightarrow y = 2$$

Therefore we get,

$x = 2, y = 2$

Solution 4:

(i) The abscissa is 2

Now using the given graph the co-ordinate of the given point A is given by (2,2)

(ii) The ordinate is 0

Now using the given graph the co-ordinate of the given point B is given by (5,0)

(iii) The ordinate is 3

Now using the given graph the co-ordinate of the given point C and E is given by (-4,3)& (6,3)

(iv) The ordinate is -4

Now using the given graph the co-ordinate of the given point D is given by (2,-4)

(v) The abscissa is 5

Now using the given graph the co-ordinate of the given point H, B and G is given by (5,5) ,(5,0) & (5,-3)

(vi)The abscissa is equal to the ordinate.

Now using the given graph the co-ordinate of the given point I,A & H is given by (4,4),(2,2) & (5,5)

(vii)The ordinate is half of the abscissa

Now using the given graph the co-ordinate of the given point E is given by (6,3)

Solution 5:

(i)The ordinate of a point is its x-co-ordinate.
False.
(ii)The origin is in the first quadrant.
False.
(iii)The y-axis is the vertical number line.
True.
(iv)Every point is located in one of the four quadrants.
True.
(v)If the ordinate of a point is equal to its abscissa; the point lies either in the first quadrant or in the second quadrant.
False.
(vi)The origin (0,0) lies on the x-axis.
True.
(vii)The point (a,b) lies on the y-axis if b=0.
False

Solution 6:

(i) $3-2x=7;\ 2y+1=10-2\frac{1}{2}y$

Now

$$3-2x=7$$
$$3-7=2x$$
$$-4=2x$$
$$-2=x$$

Again

$$2y+1=10-2\frac{1}{2}y$$
$$2y+1=10-\frac{5}{2}y$$
$$4y+2=20-5y$$
$$4y+5y=20-2$$
$$9y=18$$
$$y=2$$

$\therefore$ The co-ordinates of the point $(-2,2)$

(ii) $\frac{2a}{3}-1=\frac{a}{2},\ \frac{15-4b}{7}=\frac{2b-1}{3}$

Now

$$\frac{2a}{3}-1=\frac{a}{2}$$
$$\frac{2a}{3}-\frac{a}{2}=1$$
$$\frac{4a-3a}{6}=1$$
$$a=6$$

Again

$$\frac{15-4b}{7}=\frac{2b-1}{3}$$
$$45-12b=14b-7$$
$$45+7=14b+12b$$
$$52=26b$$

$$2=b$$

$\therefore$ The co-ordinates of the point $(6,2)$

(iii) $5x-(5-x)=\frac{1}{2}(3-x)$; $4-3y=\frac{4+y}{3}$

Now

$$5x-(5-x)=\frac{1}{2}(3-x)$$
$$(5x+x)-5=\frac{1}{2}(3-x)$$
$$12x-10=3-x$$
$$12x+x=3+10$$

$$13x=13$$
$$x=1$$

Again

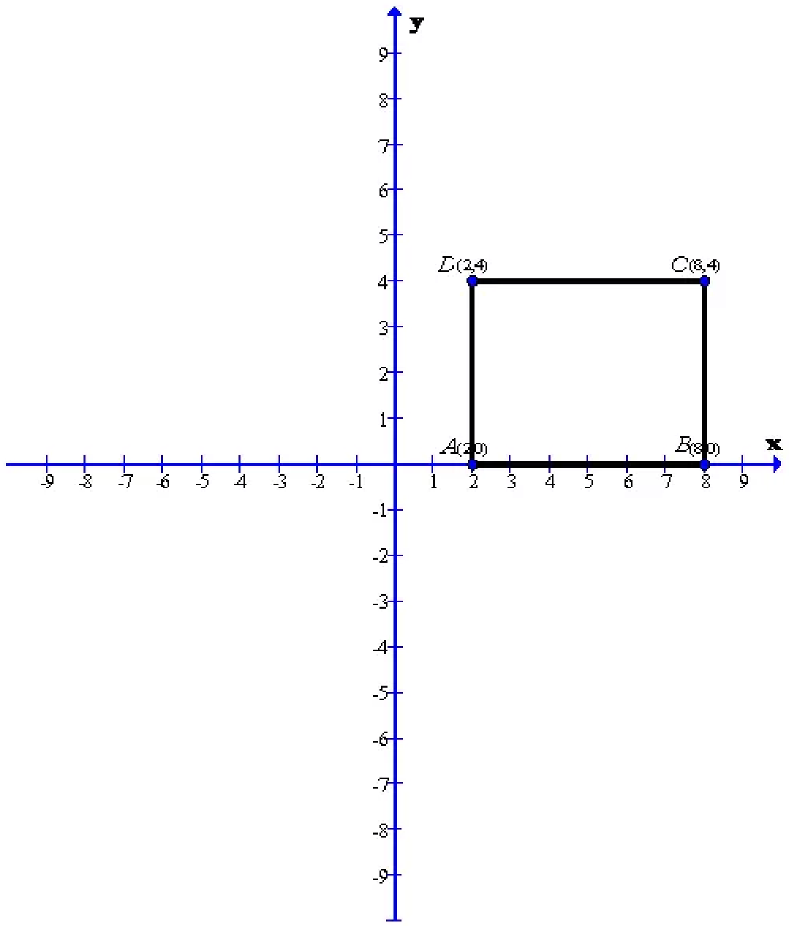
$$4-3y=\frac{4+y}{3}$$
$$12-9y=4+y$$
$$12-4=y+9y$$
$$8=10y$$

$$\frac{8}{10}=y$$
$$\frac{4}{5}=y$$

$\therefore$ The co-ordinates of the point $\left(1,\frac{4}{5}\right)$

Solution 7:

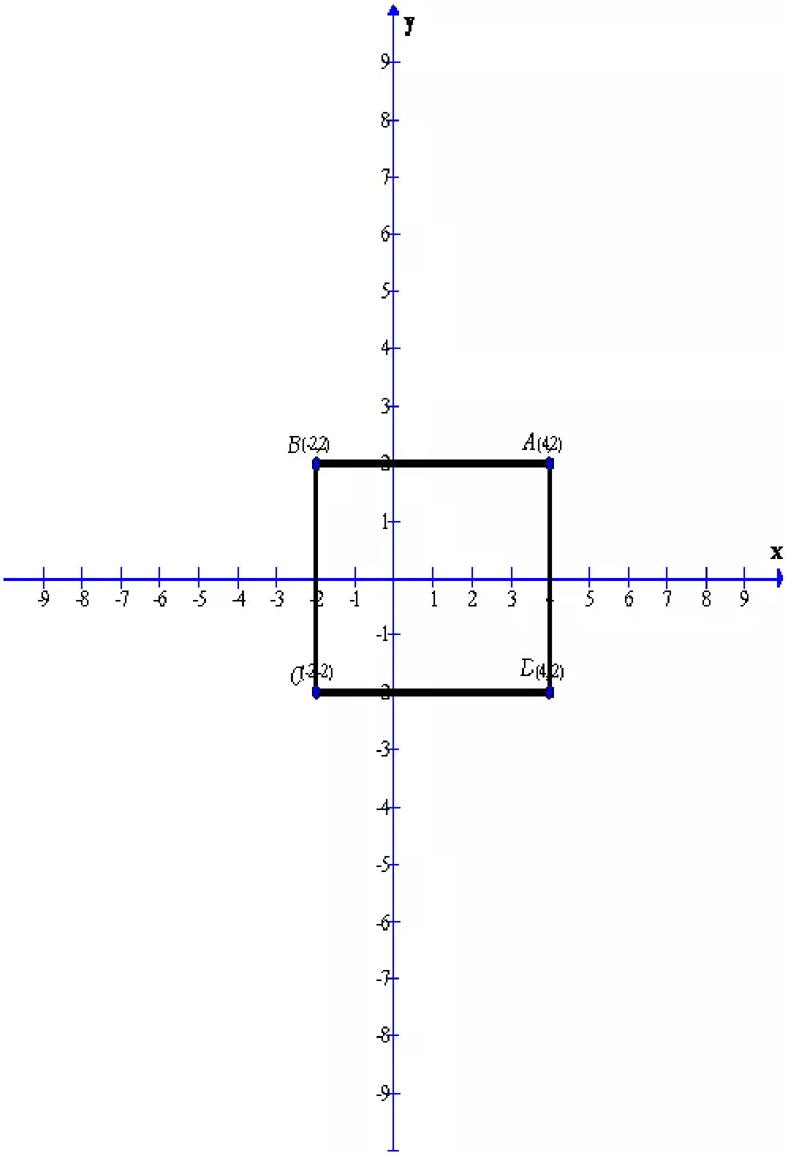
(i) $A(2,0)$, $B(8,0)$ and $C(8,4)$



After plotting the given points A(2,0), B(8,0) and C(8,4) on a graph paper; joining A with B and B with C. From the graph it is clear that the vertical distance between the points B(8,0) and C(8,4) is 4 units, therefore the vertical distance between the points A(2,0) and D must be 4 units. Now complete the rectangle ABCD

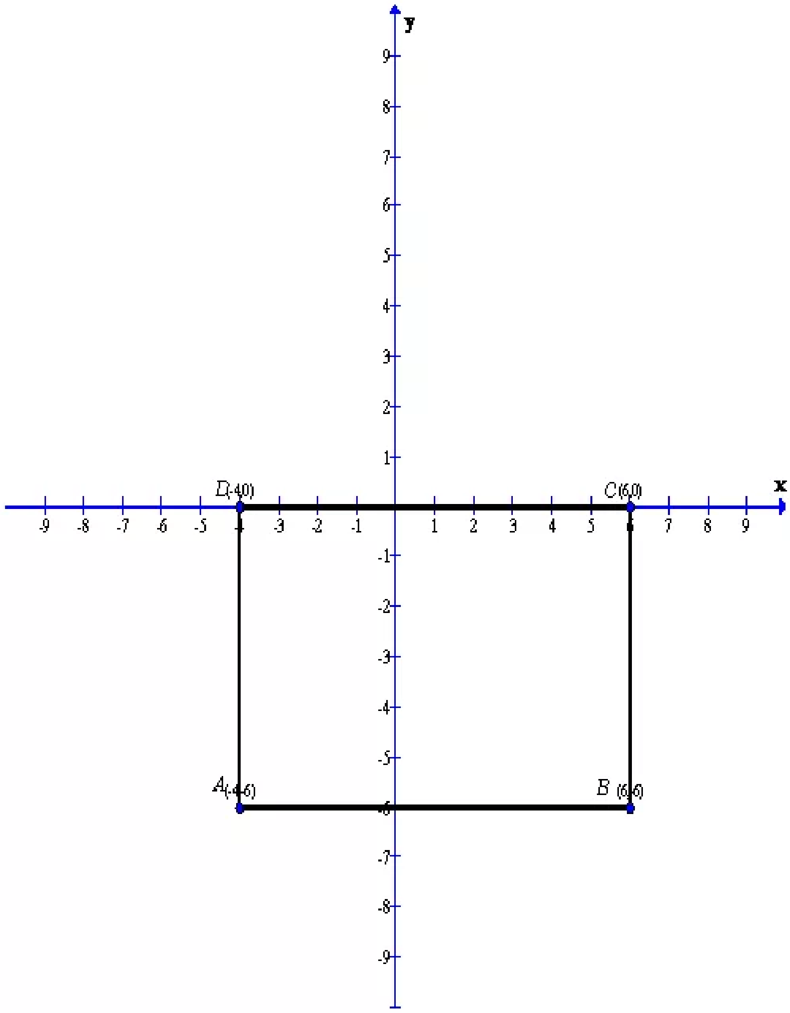
As is clear from the graph D(2,4)

(ii)A(4,2), B(-2,-2) and D(4,-2)



After plotting the given points A(4,2), B(-2,2) and D(4,-2) on a graph paper; joining A with B and A with D. From the graph it is clear that the vertical distance between the points A(4,2) and D(4,-2) is 4 units and the horizontal distance between the points A(4,2) and B(-2,2) is 6 units , therefore the vertical distance between the points B(-2,2)and C must be 4 units and the horizontal distance between the points B(-2,2) and C must be 6 units. Now complete the rectangle ABCD
As is clear from the graph C(-2,2)

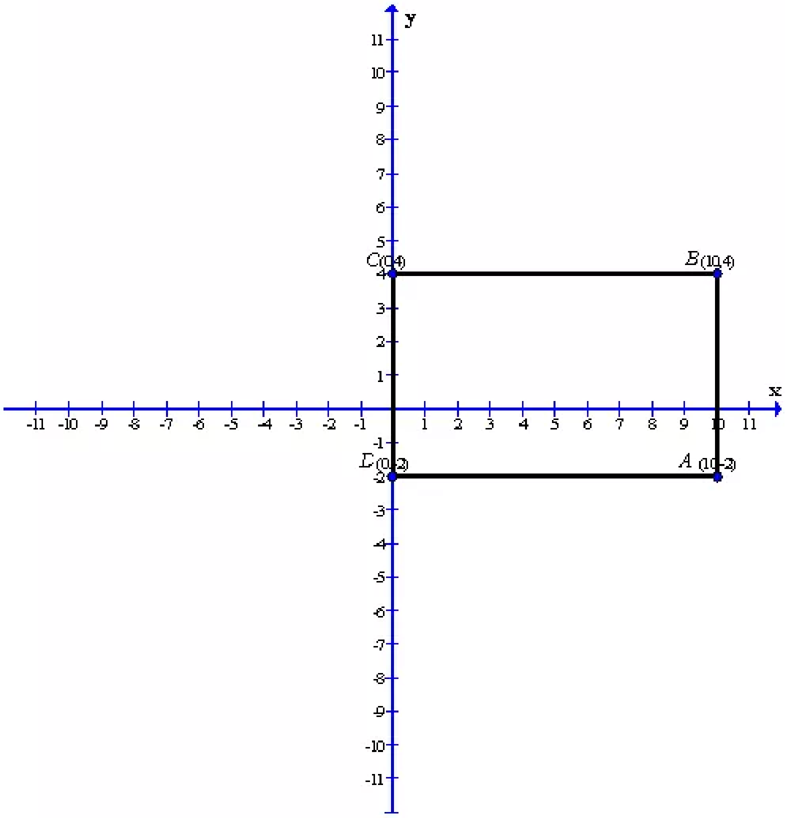
(iii) $A(-4,-6)$, $C(6,0)$ and $D(-4,0)$



After plotting the given points $A(-4,-6)$, $C(6,0)$ and $D(-4,0)$ on a graph paper; joining D with A and D with C. From the graph it is clear that the vertical distance between the points $D(-4,0)$ and $A(-4,-6)$ is 6 units and the horizontal distance between the points $D(-4,0)$ and $C(6,0)$ is 10 units, therefore the vertical distance between the points $C(6,0)$ and B must be 6 units and the horizontal distance between the points $A(-4,-6)$ and B must be 10 units. Now complete the rectangle $ABCD$

As is clear from the graph $B(6,-6)$

(iv) $B(10,4)$, $C(0,4)$ and $D(0,-2)$

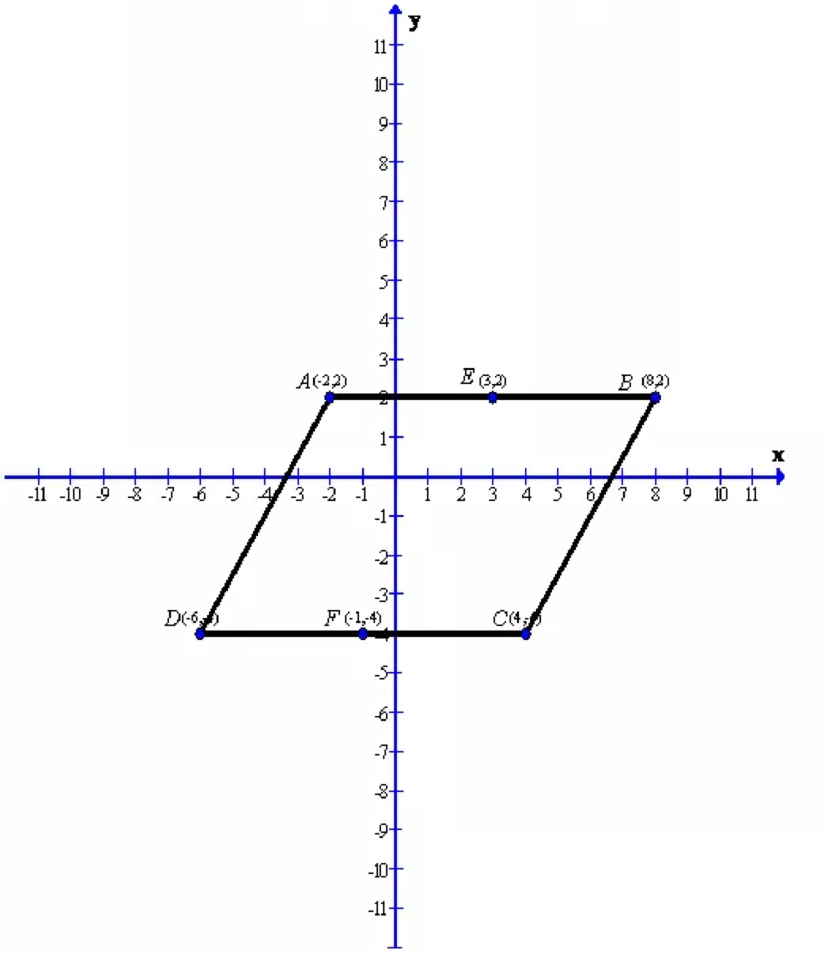


After plotting the given points $B(10,4)$, $C(0,4)$ and $D(0,-2)$ on a graph paper; joining C with B and C with D. From the graph it is clear that the vertical distance between the points $C(0,4)$ and $D(0,-2)$ is 6 units and the horizontal distance between the points $C(0,4)$ and $B(10,4)$ is 10 units , therefore the vertical distance between the points $B(10,4)$ and A must be 6 units and the horizontal distance between the points $D(0,-2)$ and A must be 10 units. Now complete the rectangle $ABCD$

As is clear from the graph $A(10,-2)$

Solution 8:

Given A(2,-2), B(8,2) and C(4,-4) are the vertices of the parallelogram ABCD



After plotting the given points A(2,-2), B(8,2) and C(4,-4) on a graph paper; joining B with C and B with A . Now complete the parallelogram ABCD.

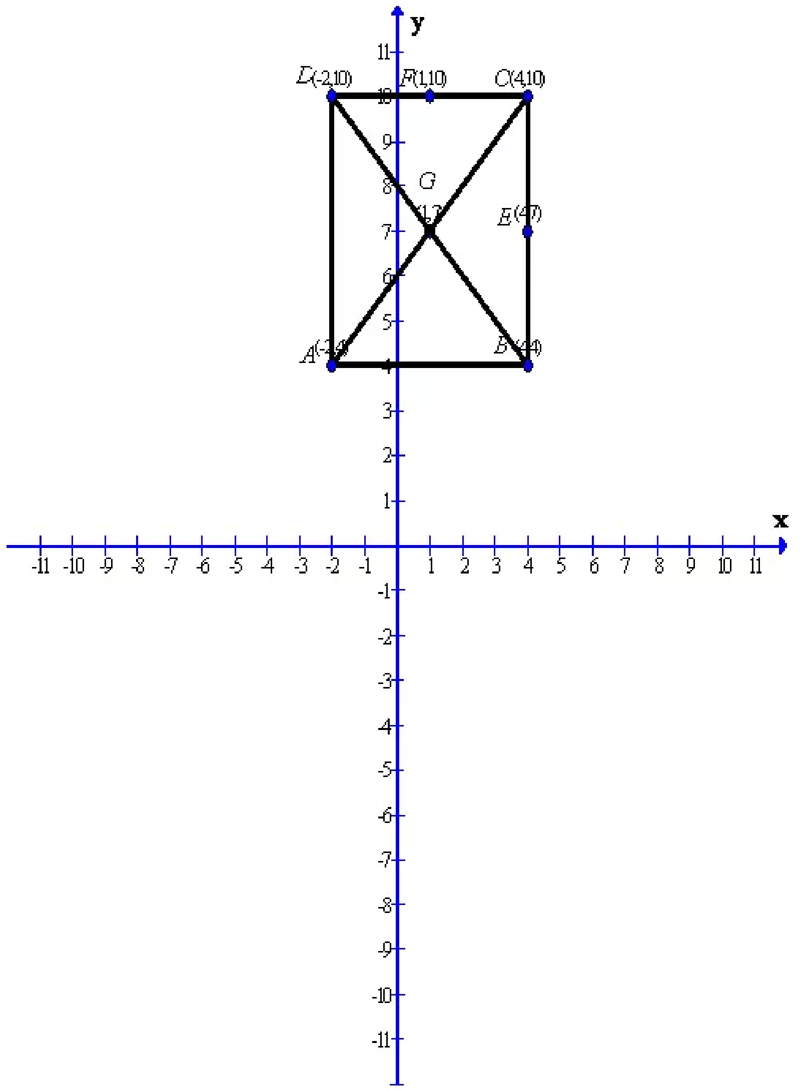
As is clear from the graph D(-6,4)

Now from the graph we can find the mid points of the sides AB and CD.

Therefore the co-ordinates of the mid-point of AB is E(3,2) and the co-ordinates of the mid-point of CD is F(-1,-4)

Solution 9:

Given $A(-2,4)$, $C(4,10)$ and $D(-2,10)$ are the vertices of a square $ABCD$



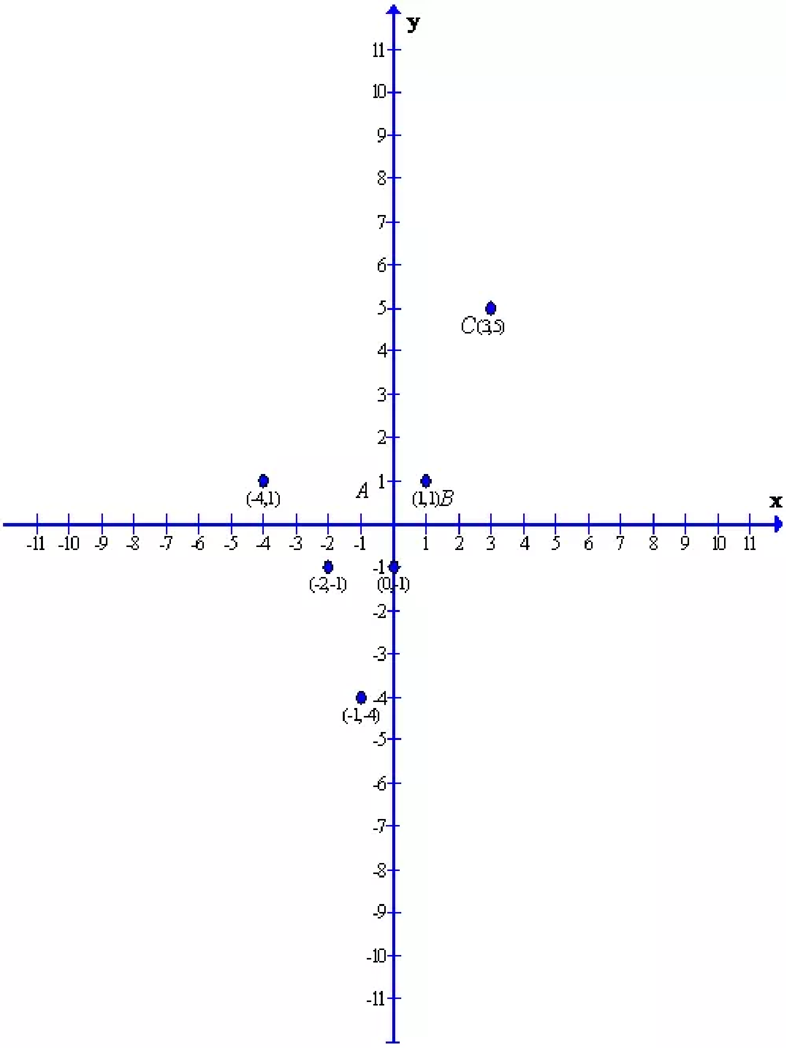
After plotting the given points $A(-2,4)$, $C(4,10)$ and $D(-2,10)$ on a graph paper; joining D with A and D with C. Now complete the square $ABCD$

As is clear from the graph $B(4,4)$

Now from the graph we can find the mid points of the sides BC and CD and the co-ordinates of the diagonals of the square.

Therefore the co-ordinates of the mid-point of BC is $E(4,7)$ and the co-ordinates of the mid-point of CD is $F(1,10)$ and the co-ordinates of the diagonals of the square is $G(1,7)$

Solution 10:



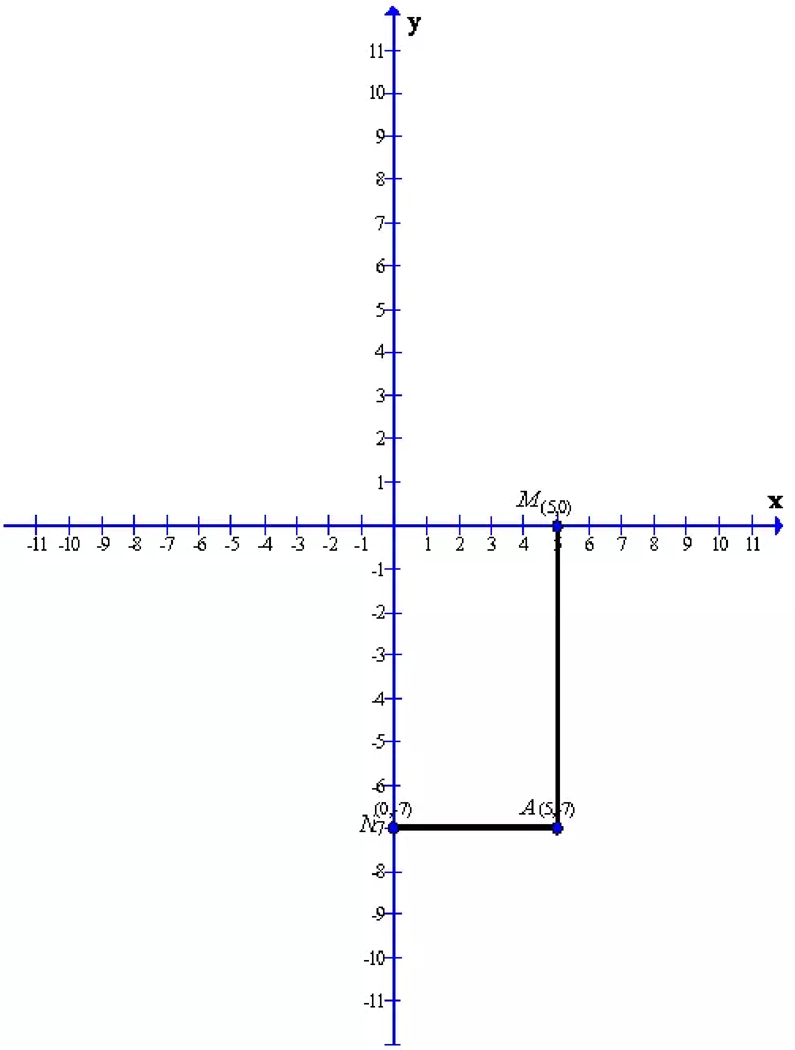
After plotting the given points, we have clearly seen from the graph that

(i) $A(3,5)$, $B(1,1)$ and $C(0,-1)$ are collinear.

(ii) $P(-2,-1)$, $Q(-1,-4)$ and $R(-4,1)$ are non-collinear.

Solution 11:

Given $A(5,-7)$



After plotting the given point $A(5,-7)$ on a graph paper. Now let us draw a perpendicular AM from the point $A(5,-7)$ on the x-axis and a perpendicular AN from the point $A(5,-7)$ on the y-axis.

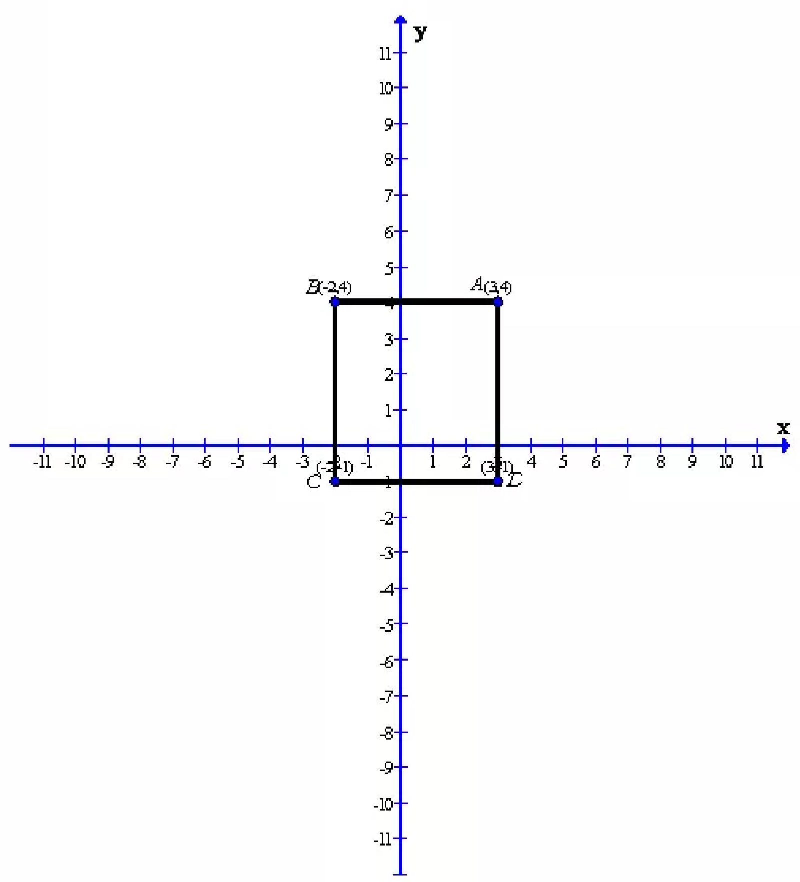
As from the graph clearly we get the co-ordinates of the points M and N

Co-ordinate of the point M is $(5,0)$

Co-ordinate of the point N is $(0,-7)$

Solution 12:

Given that in square $ABCD$; $A(3,4)$, $B(-2,4)$ and $C(-2,-1)$



Solution 13:

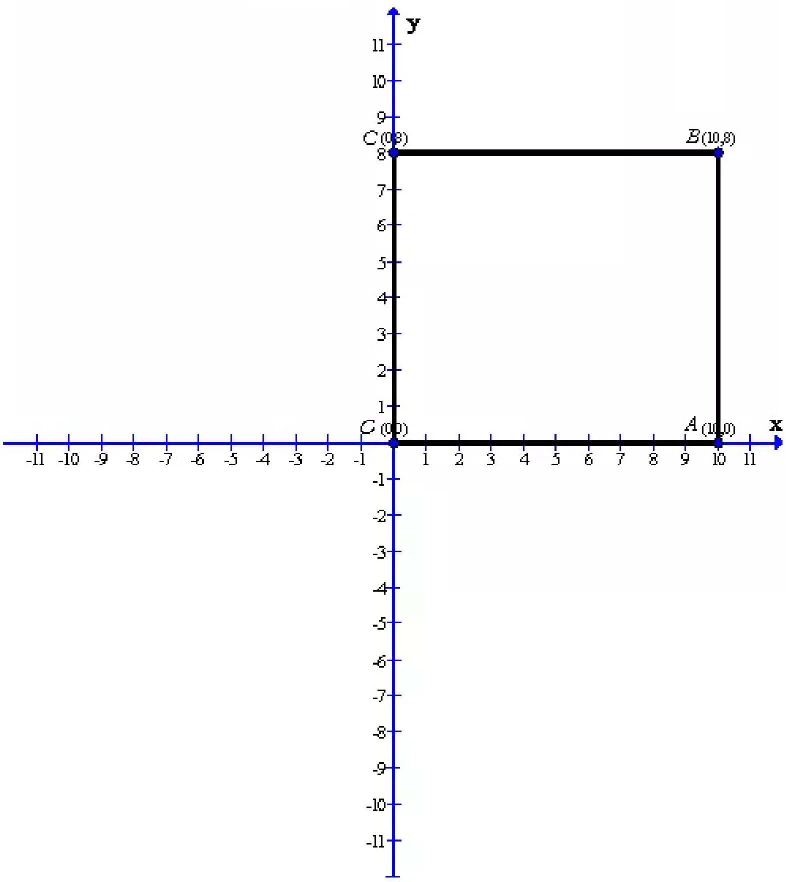
After plotting the given points $A(3,4)$, $B(-2,4)$ and $C(-2,-1)$ on a graph paper; joining B with C and B with A. From the graph it is clear that the vertical distance between the points $B(-2,4)$ and $C(-2,-1)$ is 5 units and the horizontal distance between the points $B(-2,4)$ and $A(3,4)$ is 5 units, therefore the vertical distance between the points $A(3,4)$ and D must be 5 units and the horizontal distance between the points $C(-2,-1)$ and D must be 5 units. Now complete the square $ABCD$

As is clear from the graph $D(3,-1)$

Now the area of the square $ABCD$ is given by

area of $ABCD = (\text{side})^2 = (5)^2 = 25$ units

Given that in rectangle $OABC$; point O is origin and $OA=10$ units along x-axis therefore we get $O(0,0)$ and $A(10,0)$. Also it is given that $AB=8$ units. Therefore we get $B(10,8)$ and $C(0,8)$



After plotting the points $O(0,0)$, $A(10,0)$, $B(10,8)$ and $C(0,8)$ on a graph paper; we get the above rectangle $OABC$ and the required co-ordinates of the vertices are $A(10,0)$, $B(10,8)$ and $C(0,8)$

Exercise 26(B)

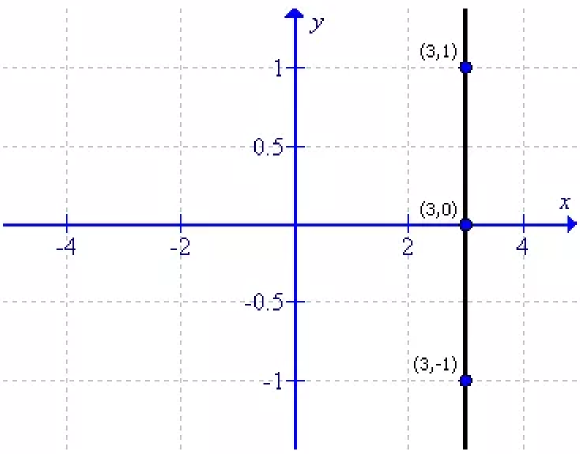
Solution 1:

(i) Since x = 3, therefore the value of y can be taken as any real no.

First prepare a table as follows:

x	3	3	3
y	-1	0	1

Thus the graph can be drawn as follows:

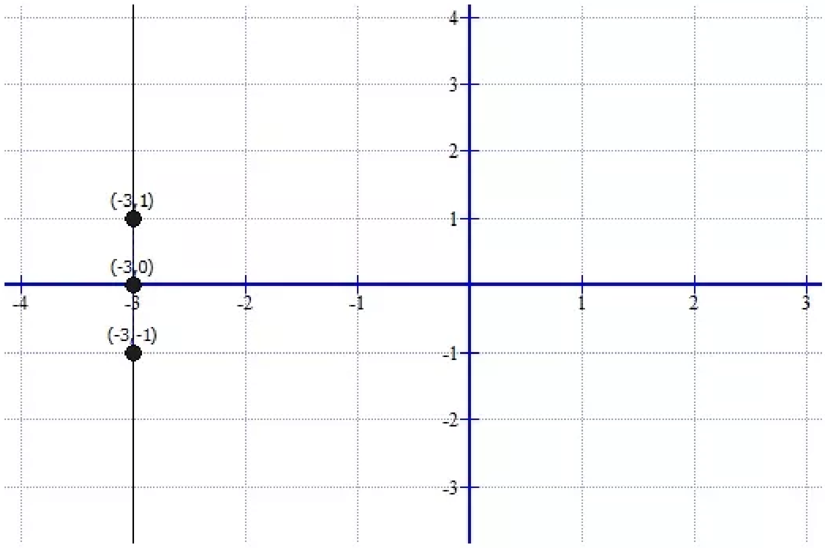


(ii)

First prepare a table as follows:

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

Thus the graph can be drawn as follows:

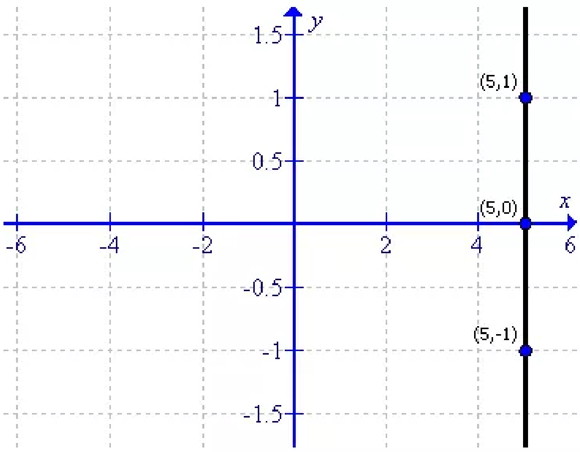


(iii)

First prepare a table as follows:

x	5	5	5
y	-1	0	1

Thus the graph can be drawn as follows:



(iv)

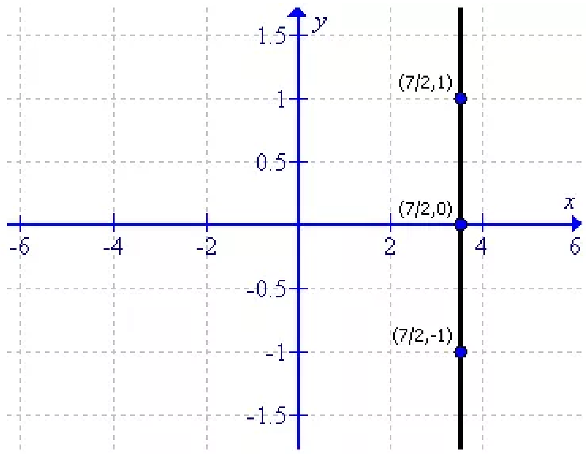
The equation can be written as:

$$x = \frac{7}{2}$$

First prepare a table as follows:

x	$\frac{7}{2}$	$\frac{7}{2}$	$\frac{7}{2}$
y	-1	0	1

Thus the graph can be drawn as follows:

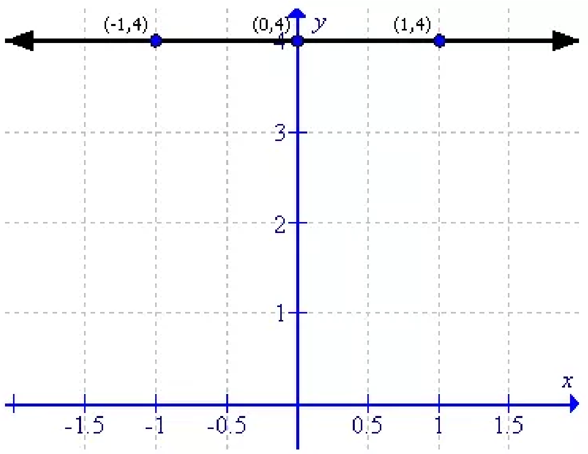


(v)

First prepare a table as follows:

x	-1	0	1
y	4	4	4

Thus the graph can be drawn as follows:

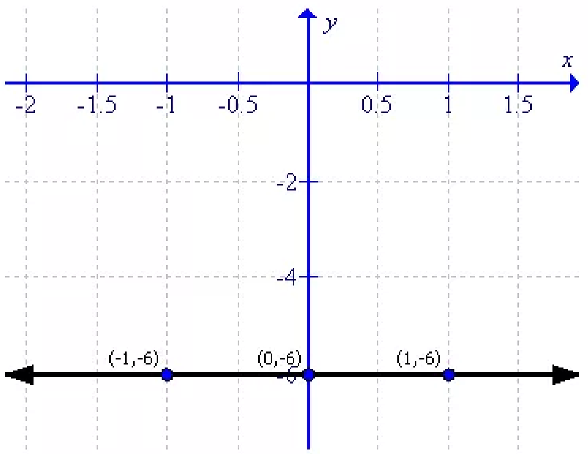


(vi)

First prepare a table as follows:

x	-1	0	1
y	-6	-6	-6

Thus the graph can be drawn as follows:

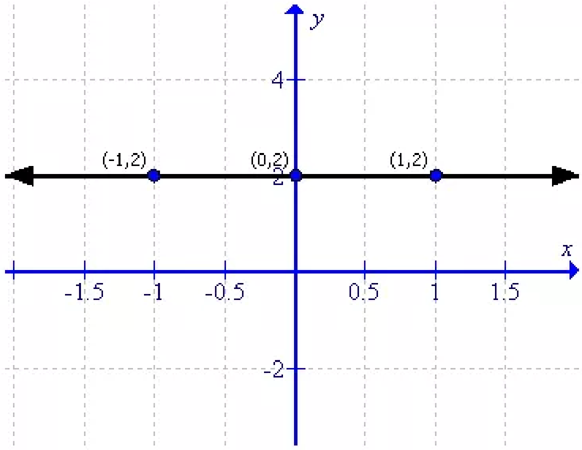


(vii)

First prepare a table as follows:

x	-1	0	1
y	2	2	2

Thus the graph can be drawn as follows:

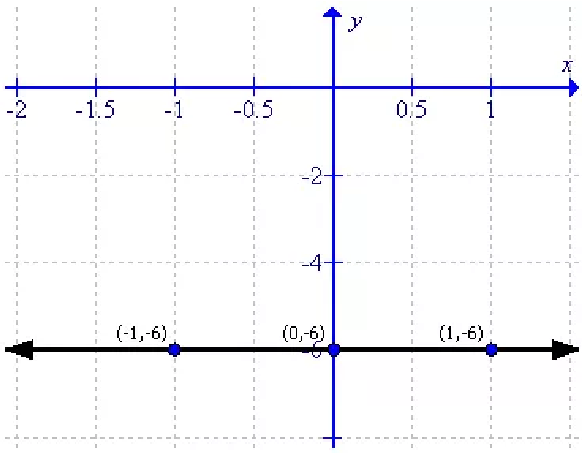


(viii)

First prepare a table as follows:

x	-1	0	1
y	-6	-6	-6

Thus the graph can be drawn as follows:

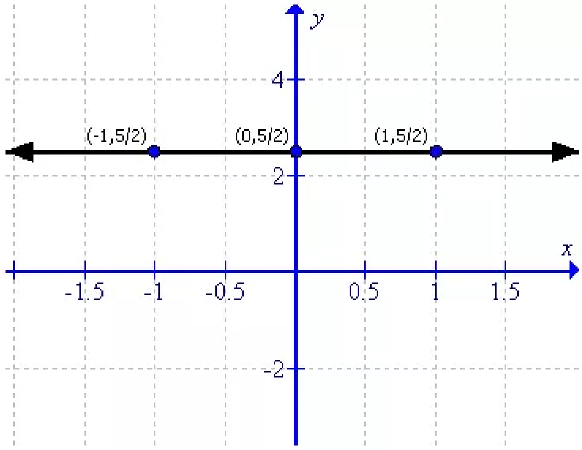


(ix)

First prepare a table as follows:

x	-1	0	1
y	$\frac{5}{2}$	$\frac{5}{2}$	$\frac{5}{2}$

Thus the graph can be drawn as follows:

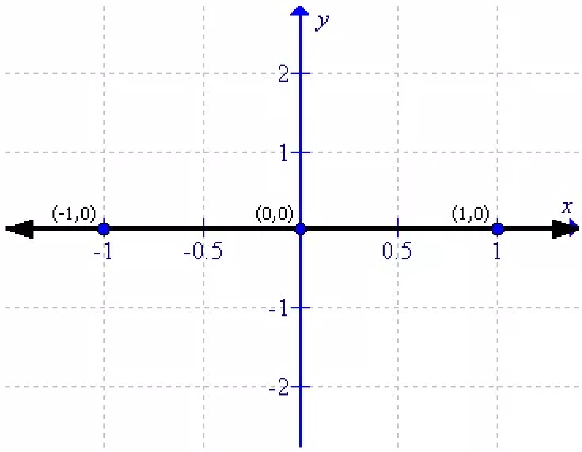


(x)

First prepare a table as follows:

x	-1	0	1
y	0	0	0

Thus the graph can be drawn as follows:

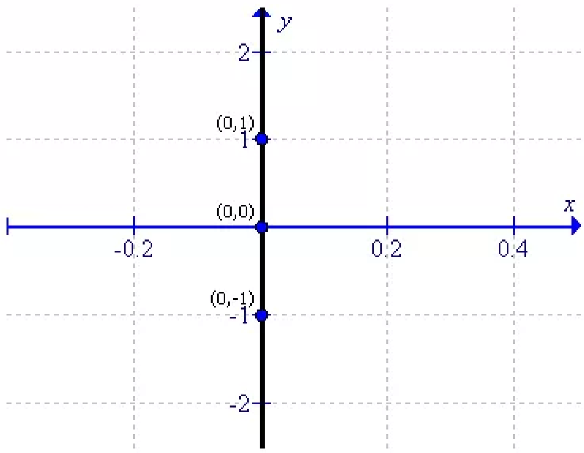


(xi)

First prepare a table as follows:

x	0	0	0
y	-1	0	1

Thus the graph can be drawn as follows:



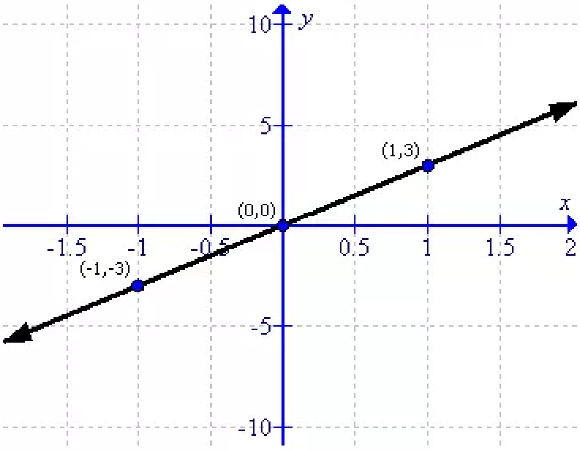
Solution 2:

(i)

First prepare a table as follows:

x	-1	0	1
y	-3	0	3

Thus the graph can be drawn as follows:

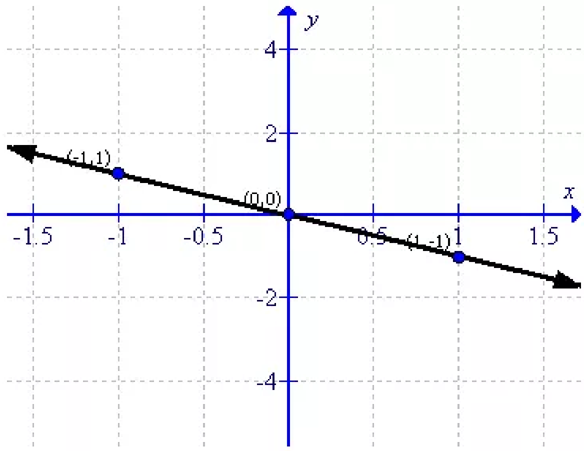


(ii)

First prepare a table as follows:

x	-1	0	1
y	1	0	-1

Thus the graph can be drawn as follows:

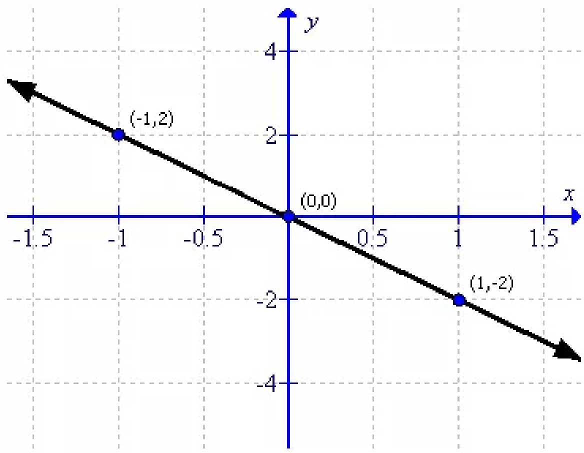


(iii)

First prepare a table as follows:

x	-1	0	1
y	2	0	-2

Thus the graph can be drawn as follows:

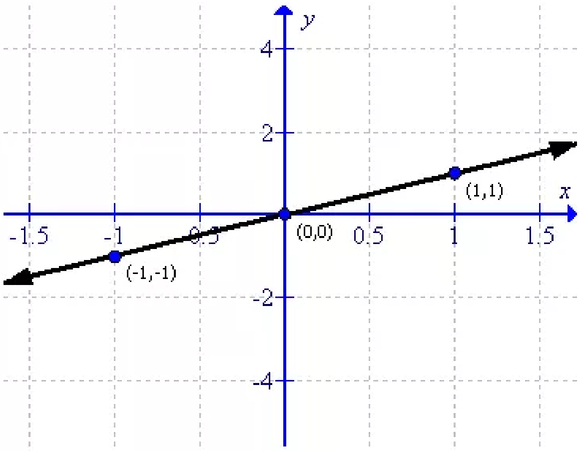


(iv)

First prepare a table as follows:

x	-1	0	1
y	-1	0	1

Thus the graph can be drawn as follows:

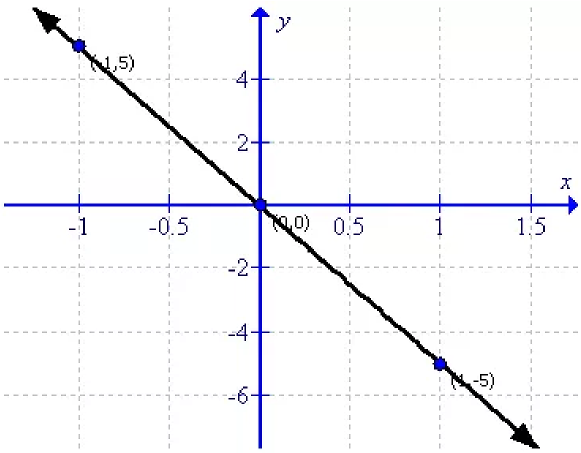


(v)

First prepare a table as follows:

x	-1	0	1
y	5	0	-5

Thus the graph can be drawn as follows:

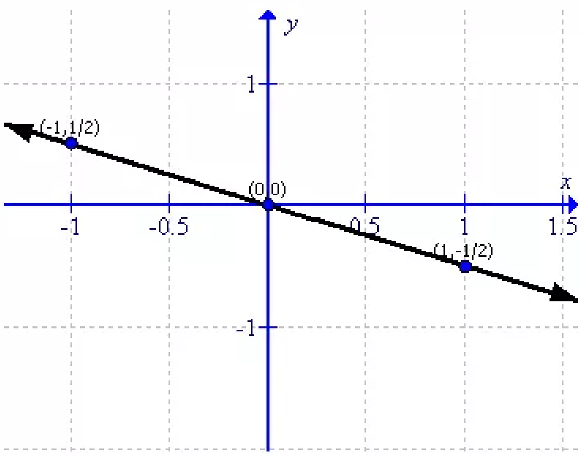


(vi)

First prepare a table as follows:

x	-1	0	1
y	$\frac{1}{2}$	0	$-\frac{1}{2}$

Thus the graph can be drawn as follows:

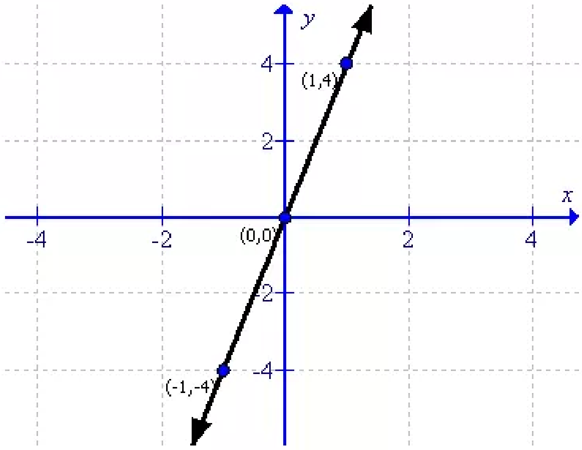


(vii)

First prepare a table as follows:

x	-1	0	1
y	-4	0	4

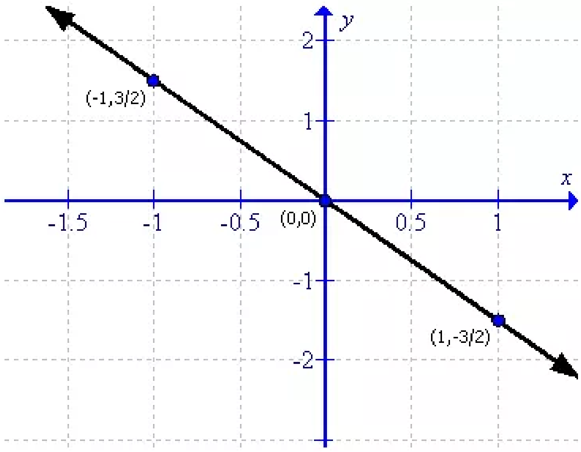
Thus the graph can be drawn as follows:



(viii)

First prepare a table as follows:

x	-1	0	1
y	$\frac{3}{2}$	0	$-\frac{3}{2}$

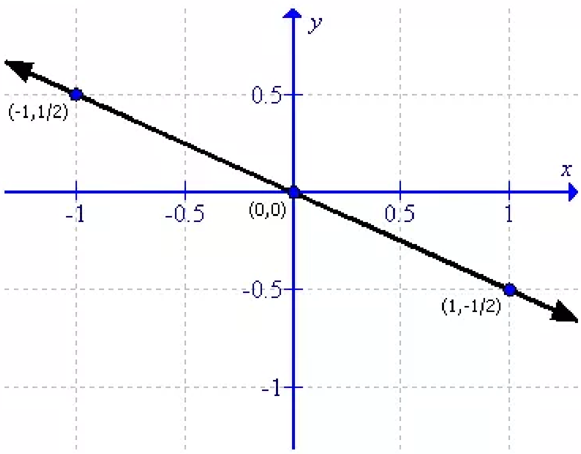


(ix)

First prepare a table as follows:

x	-1	0	1
y	$\frac{1}{2}$	0	$-\frac{1}{2}$

Thus the graph can be drawn as follows:



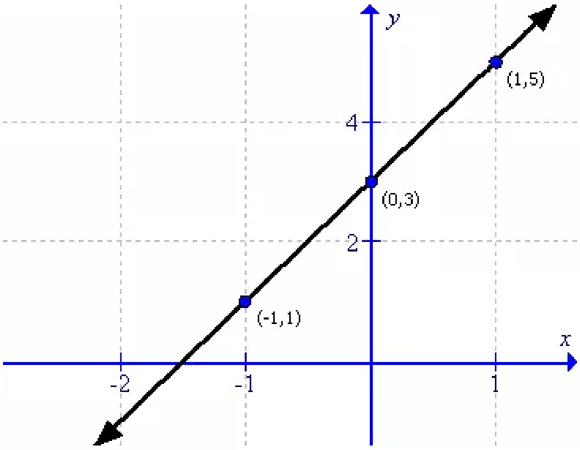
Solution 3:

(i)

First prepare a table as follows:

x	-1	0	1
y	$-\frac{5}{3}$	3	5

Thus the graph can be drawn as follows:

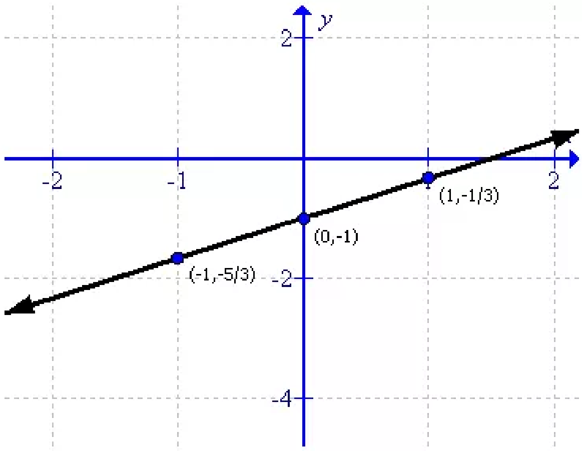


(ii)

First prepare a table as follows:

x	-1	0	1
y	$-\frac{5}{3}$	-1	$-\frac{1}{3}$

Thus the graph can be drawn as follows:

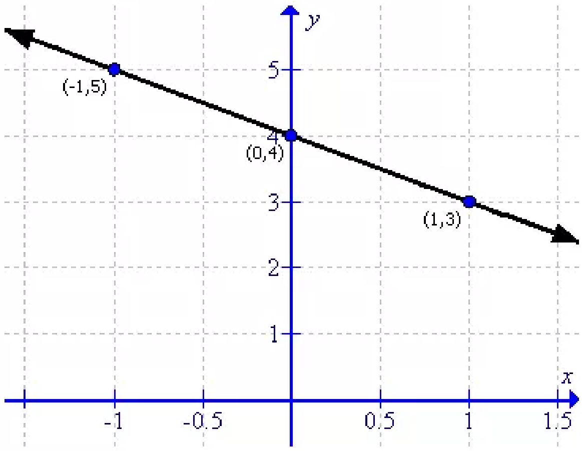


(iii)

First prepare a table as follows:

x	-1	0	1
y	5	4	3

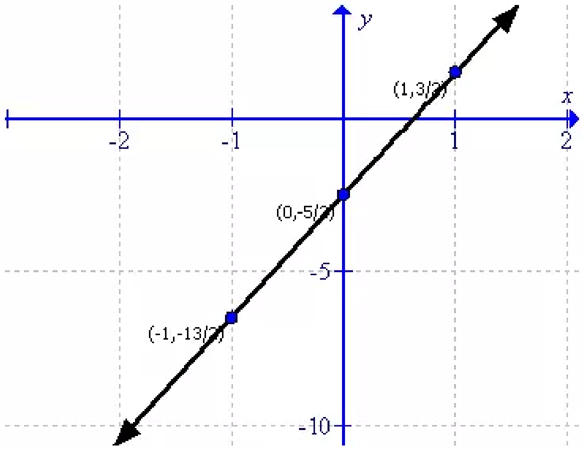
Thus the graph can be drawn as follows:



First prepare a table as follows:

x	-1	0	1
y	$-\frac{13}{2}$	$-\frac{5}{2}$	$\frac{3}{2}$

Thus the graph can be drawn as follows:

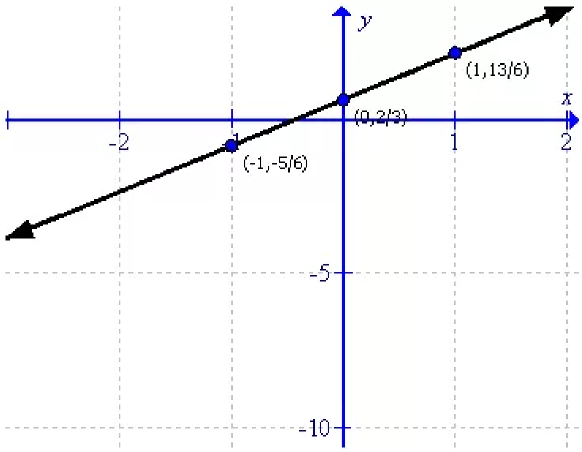


(v)

First prepare a table as follows:

x	-1	0	1
y	$-\frac{5}{6}$	$\frac{2}{3}$	$\frac{13}{6}$

Thus the graph can be drawn as follows:

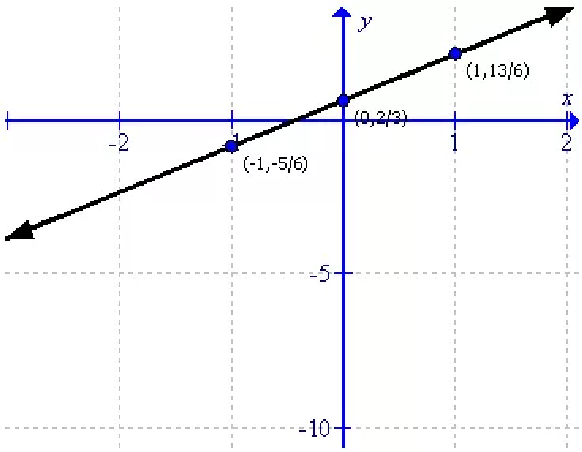


(vi)

First prepare a table as follows:

x	-1	0	1
y	-2	$-\frac{4}{3}$	$-\frac{2}{3}$

Thus the graph can be drawn as follows:

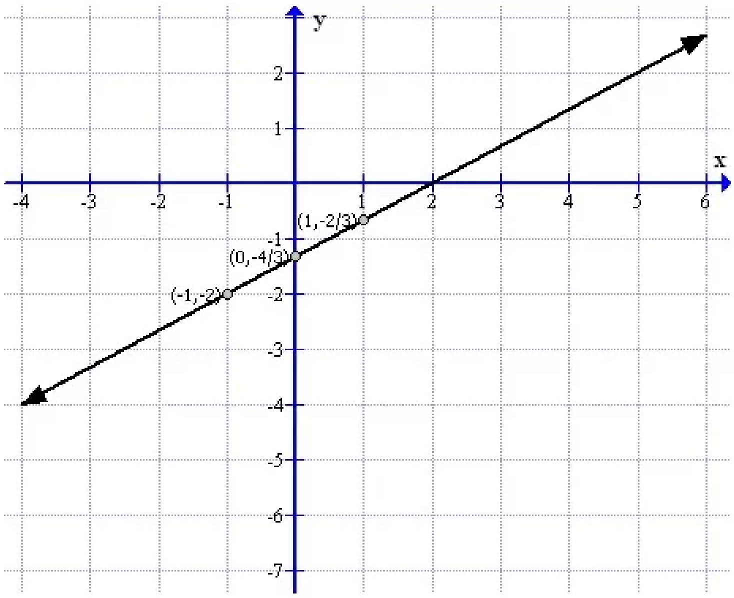


(vi)

First prepare a table as follows:

x	-1	0	1
y	-2	$-\frac{4}{3}$	$-\frac{2}{3}$

Thus the graph can be drawn as follows:



(vii)

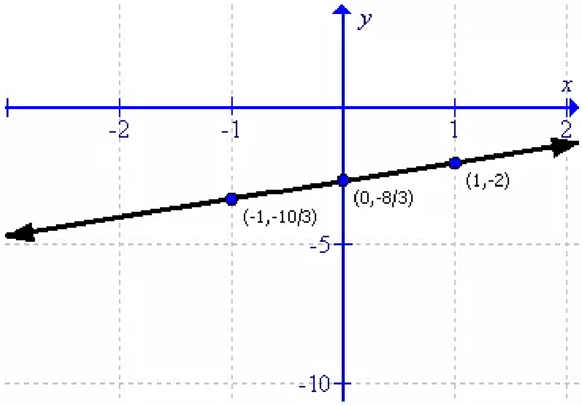
The equation will become:

$$2x-3y=8$$

First prepare a table as follows:

x	-1	0	1
y	$-\frac{10}{3}$	$-\frac{8}{3}$	-2

Thus the graph can be drawn as follows:



(viii)

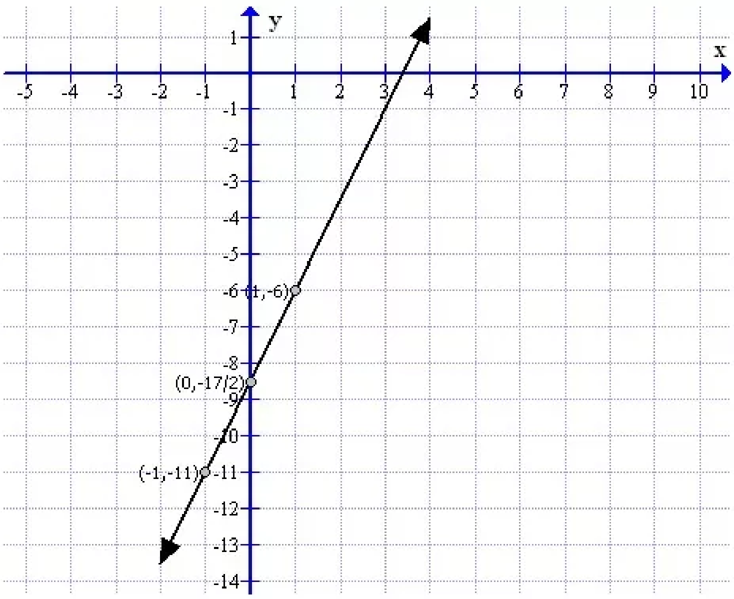
The equation will become:

$$5x - 2y = 17$$

First prepare a table as follows:

x	-1	0	1
y	-11	$-\frac{17}{2}$	-6

Thus the graph can be drawn as follows:

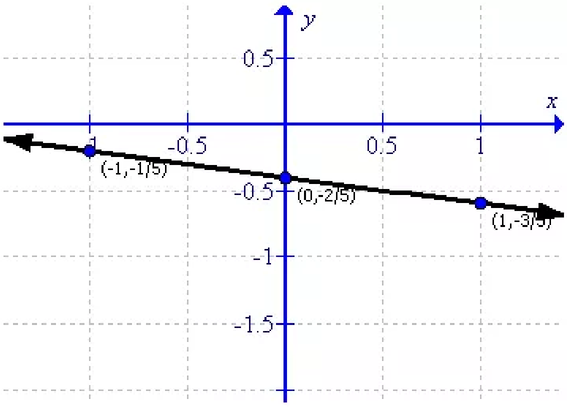


(ix)

First prepare a table as follows:

x	-1	0	1
y	$-\frac{1}{5}$	$-\frac{2}{5}$	$-\frac{3}{5}$

Thus the graph can be drawn as follows:



Solution 4:

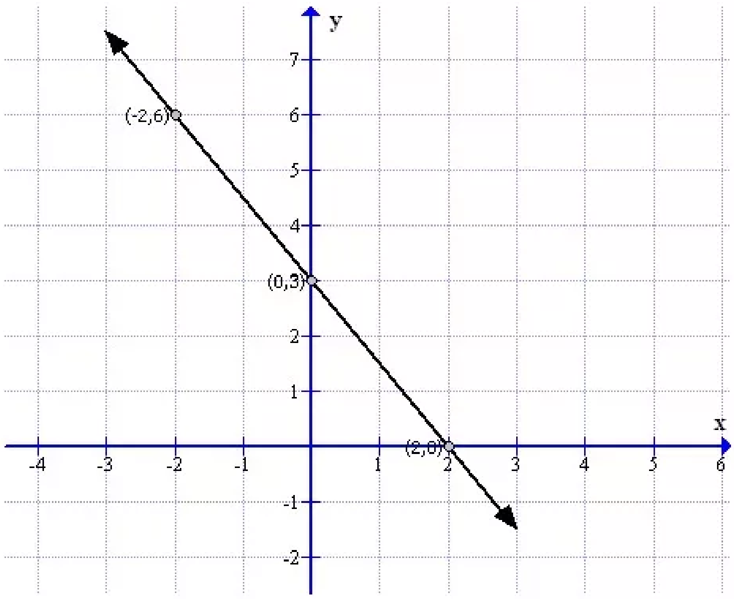
(i)

To draw the graph of 3x + 2y = 6 follows the steps:

First prepare a table as below:

X	-2	0	2
Y	6	3	0

Now sketch the graph as shown:



From the graph it can verify that the line intersect *x* axis at (2,0) and *y* at (0,3).

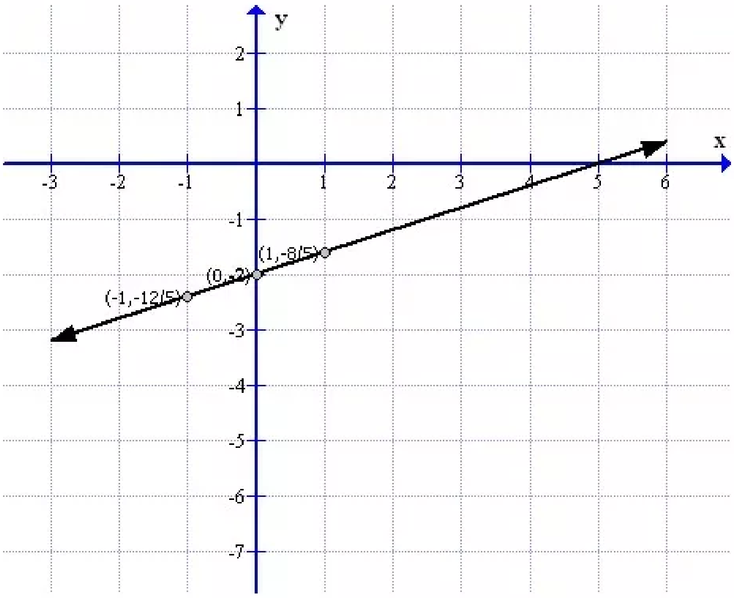
(ii)

To draw the graph of 2x - 5y = 10 follows the steps:

First prepare a table as below:

X	-1	0	1
Y	$-\frac{12}{5}$	-2	$-\frac{8}{5}$

Now sketch the graph as shown:



From the graph it can verify that the line intersect *x* axis at (5,0) and *y* at (0,-2).

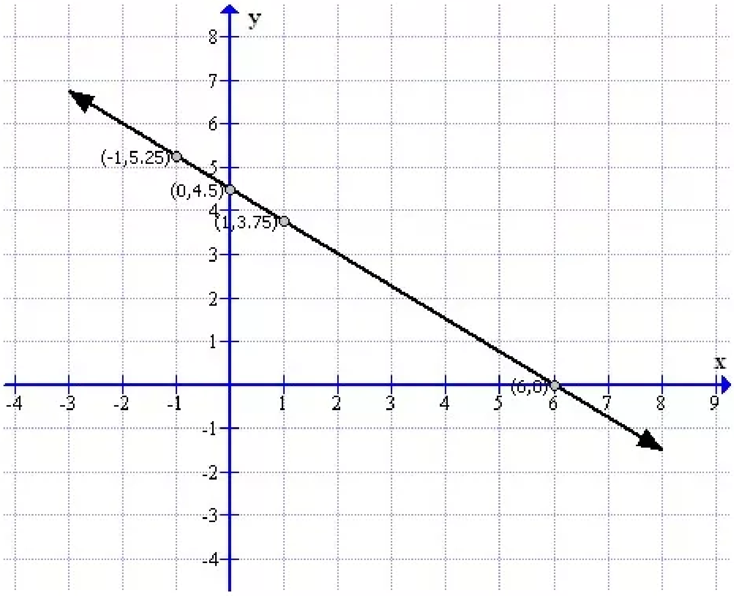
(iii)

To draw the graph of $\frac{x}{2}+\frac{2y}{3}=3$ follows the steps:

First prepare a table as below:

X	-1	0	1
Y	5.25	4.5	3.75

Now sketch the graph as shown:



From the graph it can verify that the line intersect *x* axis at (10,0) and *y* at (0,7.5).

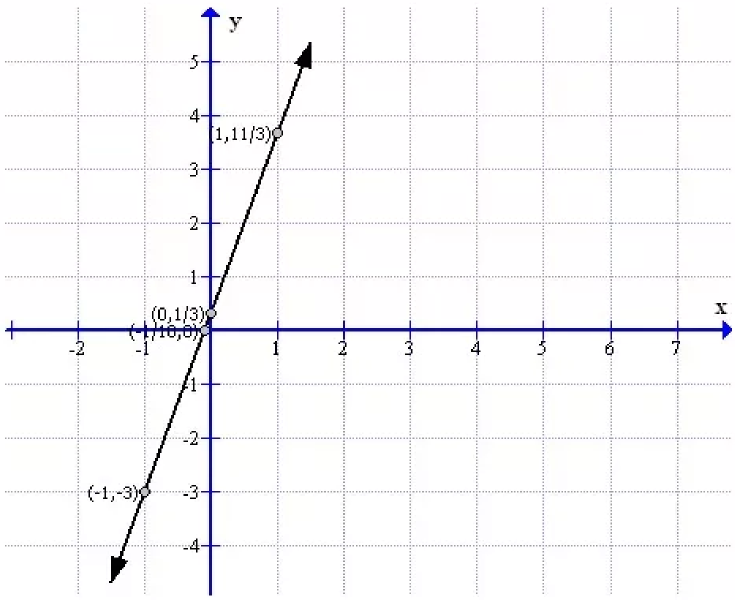
(iv)

To draw the graph of $\frac{2x-1}{3}-\frac{y-2}{5}=0$ follows the steps:

First prepare a table as below:

X	-1	0	1
Y	-3	$\frac{1}{3}$	$\frac{11}{3}$

Now sketch the graph as shown:

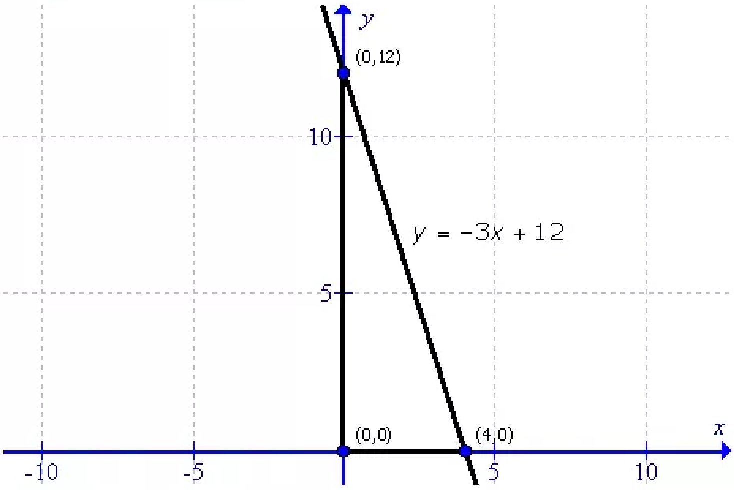


From the graph it can verify that the line intersect *x* axis at $\left(-\frac{1}{10},0\right)$ and *y* at (0,4.5).

Solution 5:

(i)

First draw the graph as follows:



This is an right trinangle.
Thus the area of the triangle will be:

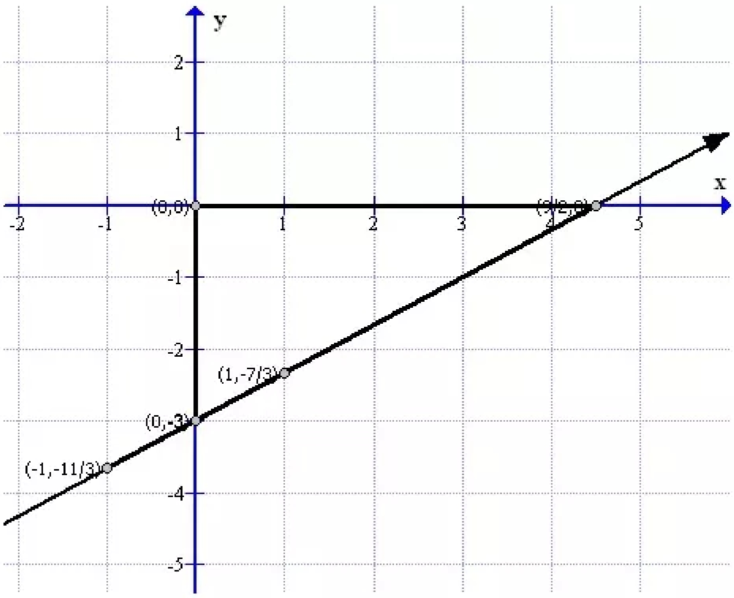
$= \frac{1}{2} \times \text{base} \times \text{altitude}$

$= \frac{1}{2} \times 4 \times 12$

$= 24$ sq.units

(ii)

First draw the graph as follows:



This is a right triangle.
Thus the area of the triangle will be:

$A = \frac{1}{2} \times \text{base} \times \text{altitude}$

$= \frac{1}{2} \times \frac{9}{2} \times 3$

$= \frac{27}{4} = 6.75$ sq.units

Solution 6:

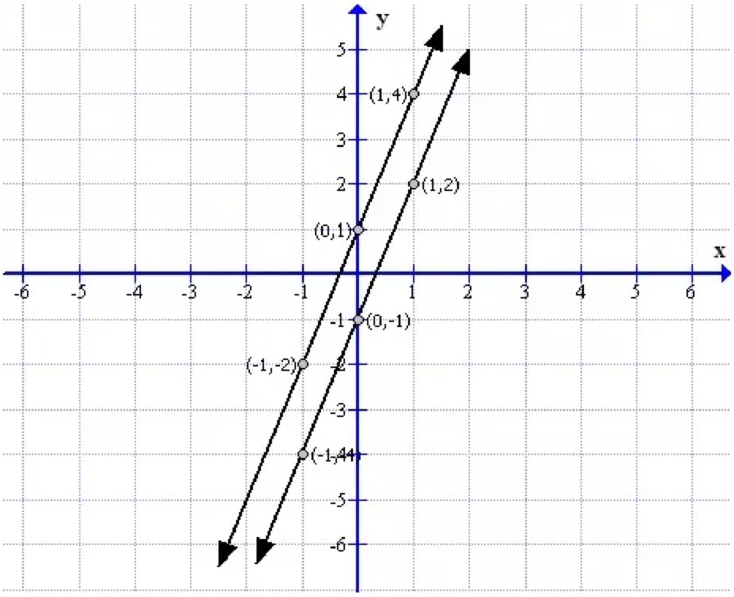
(i)

To draw the graph of y = 3x - 1 and y = 3x + 2 follows the steps:

First prepare a table as below:

X	-1	0	1
Y=3x-1	-4	-1	2
Y=3x+2	-1	2	5

Now sketch the graph as shown:



From the graph it can verify that the lines are parallel.

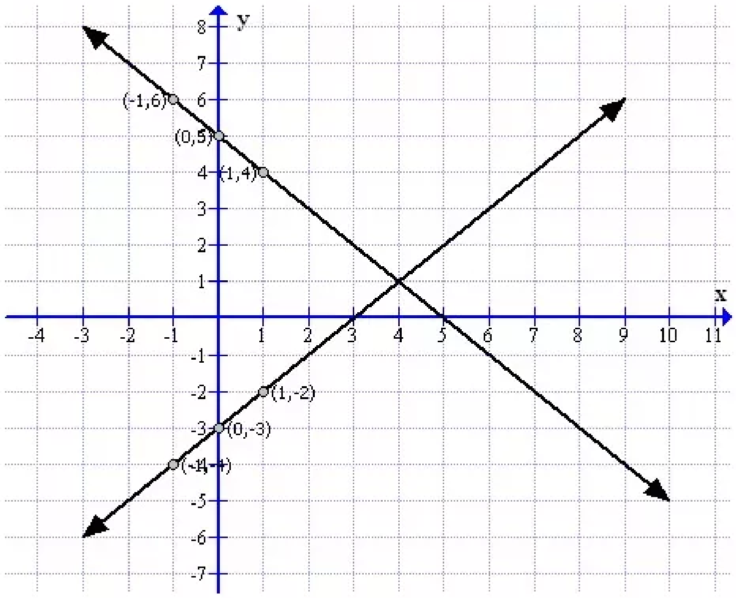
(ii)

To draw the graph of y = x - 3 and y = -x + 5 follows the steps:

First prepare a table as below:

X	-1	0	1
Y=x-3	-4	-3	-2
Y=-x+5	6	5	4

Now sketch the graph as shown:



From the graph it can verify that the lines are perpendicular.

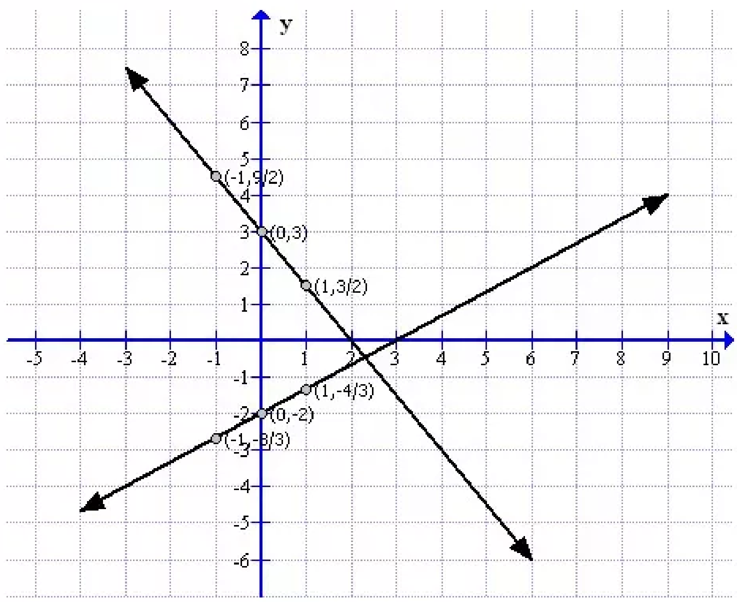
(iii)

To draw the graph of 2x - 3y = 6 and $\frac{x}{2}+\frac{y}{3}=1$ follows the steps:

First prepare a table as below:

X	-1	0	1
$y=\frac{2}{3}x-2$	$-\frac{8}{3}$	-2	$-\frac{4}{3}$
$y=-\frac{3}{2}x+3$	$\frac{9}{2}$	3	$\frac{3}{2}$

Now sketch the graph as shown:



From the graph it can verify that the lines are perpendicular.

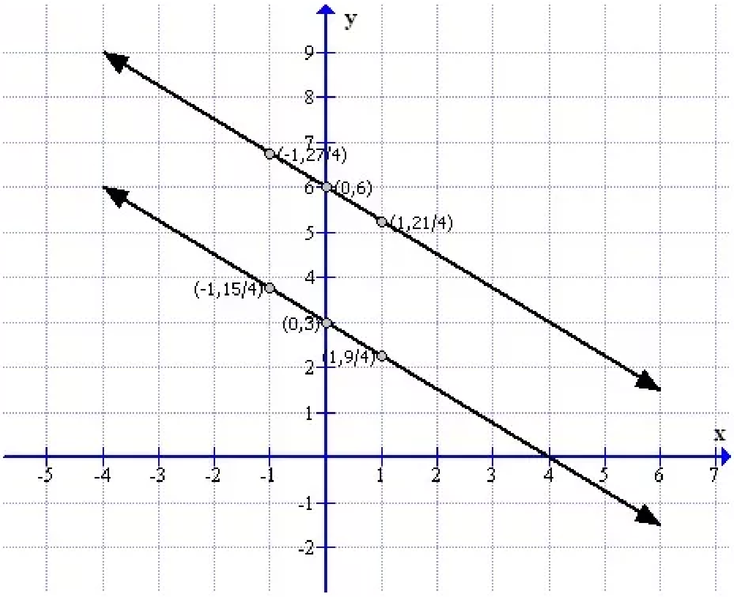
(iv)

To draw the graph of 3x + 4y = 24 and $\frac{x}{4}+\frac{y}{3}=1$ follows the steps:

First prepare a table as below:

X	-1	0	1
$y=-\frac{3}{4}x+6$	$\frac{27}{4}$	6	$\frac{21}{4}$
$y=-\frac{3}{4}x+3$	$\frac{15}{4}$	3	$\frac{9}{4}$

Now sketch the graph as shown:



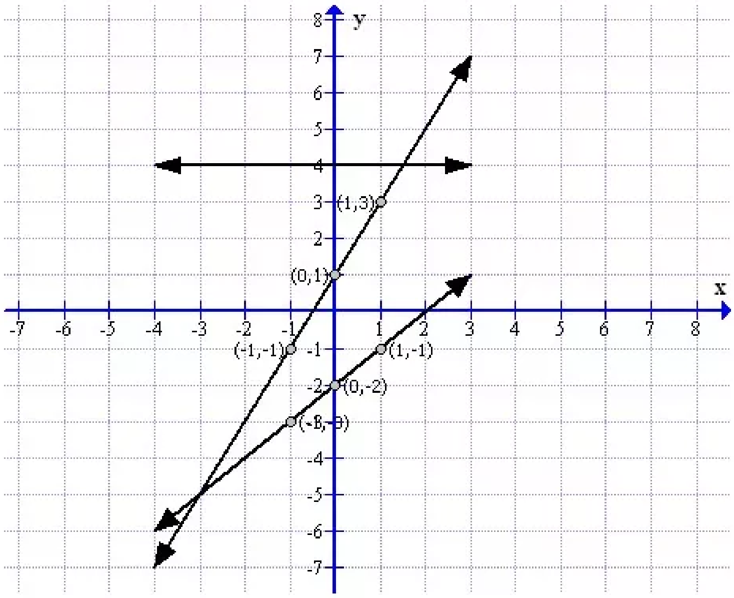
From the graph it can verify that the lines are parallel.

Solution 7:

First prepare a table as follows:

X	-1	0	1
Y=x-2	-3	-2	-1
Y=2x+1	-1	1	3
Y=4	4	4	4

Now the graph can be drawn as follows:

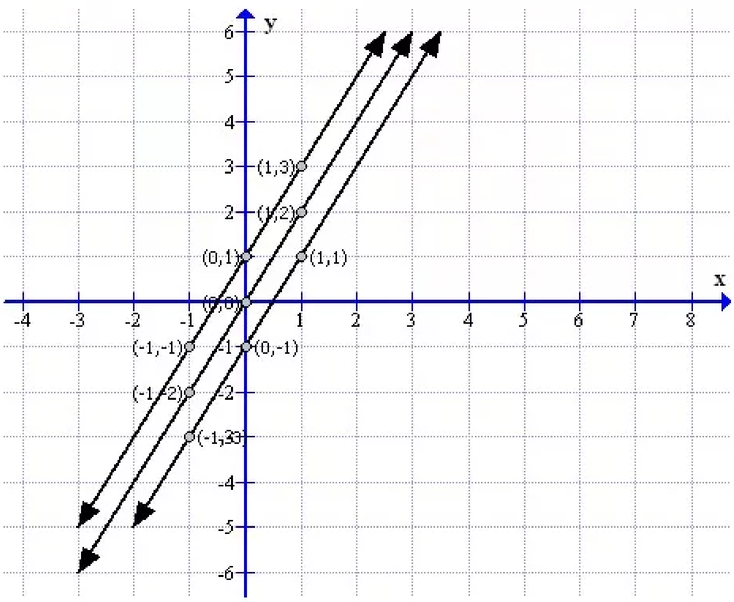


Solution 8:

First prepare a table as follows:

X	-1	0	1
Y=2x-1	-3	-1	1
Y = 2x	-2	0	2
Y=2x+1	-1	1	3

Now the graph can be drawn as follows:



The lines are parallel to each other.

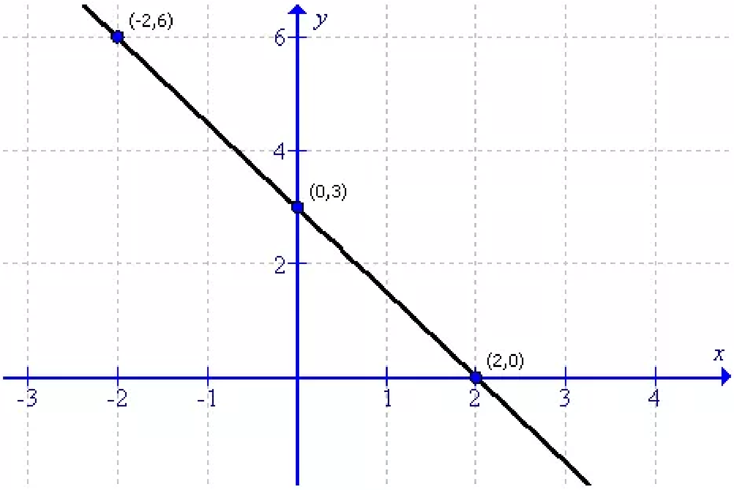
Solution 9:

To draw the graph of 3x + 2y = 6 follows the steps:

First prepare a table as below:

X	-2	0	2
Y	6	3	0

Now sketch the graph as shown:



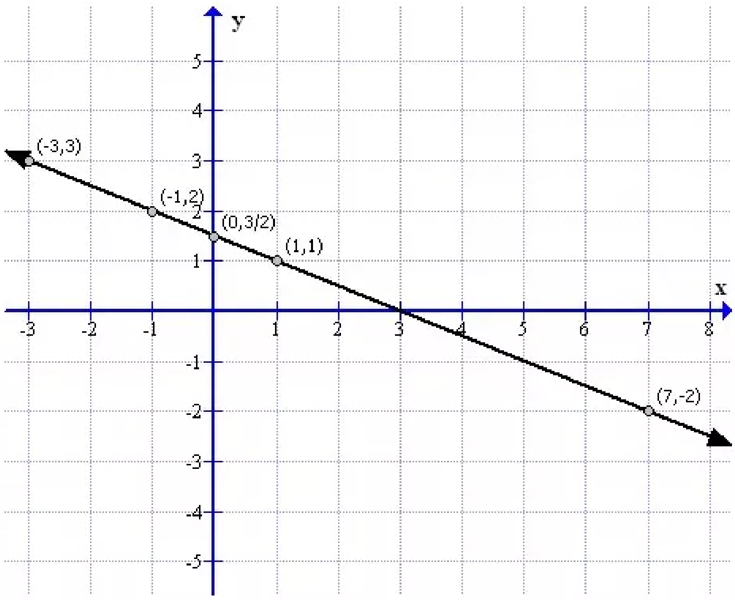
From the graph it can verify that the line intersect *x* axis at (2,0) and y at (0,3), therefore the co ordinates of P(x-axis) and Q(y-axis) are (2,0) and (0,3) respectively.

Solution 10:

First prepare a table as follows:

X	-1	0	1
Y	2	$\frac{3}{2}$	1

Thus the graph can be drawn as shown:



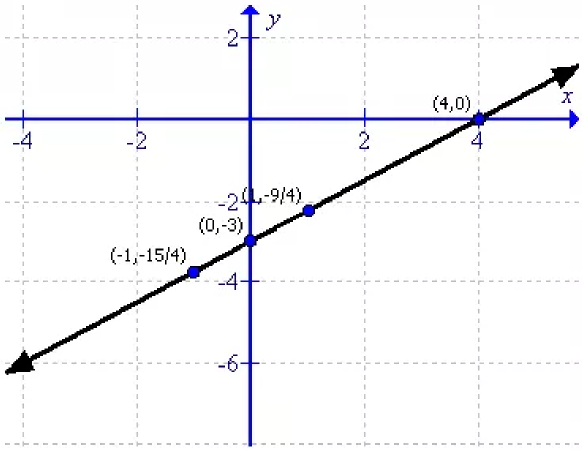
(i)
For y = 3 we have x = -3
(ii)
For y = -2 we have x = 7

Solution 11:

First prepare a table as follows:

x	-1	0	1
y	$-\frac{15}{4}$	-3	$-\frac{9}{4}$

The graph of the equation can be drawn as follows:



From the graph it can be verify that

If x = 4 the value of y = 0

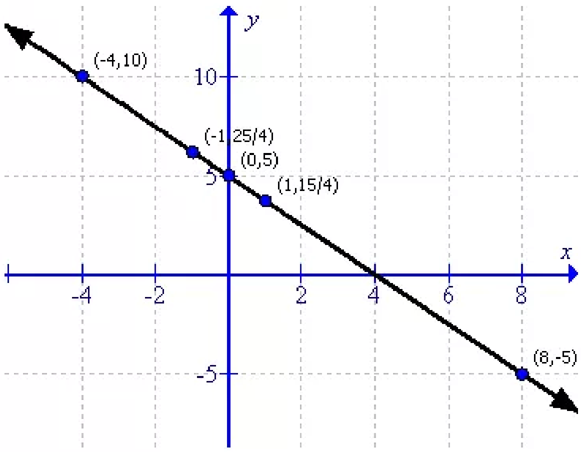
If x = 0 the value of y = -3.

Solution 12:

First prepare a table as follows:

x	-1	0	1
y	$\frac{25}{4}$	5	$\frac{15}{4}$

The graph of the equation can be drawn as follows:



From the graph it can be verified that:

for y = 10, the value of x = -4.

for x = 8 the value of y = -5.

Solution 13:

The equations can be written as follows:

$y = 2 - x$

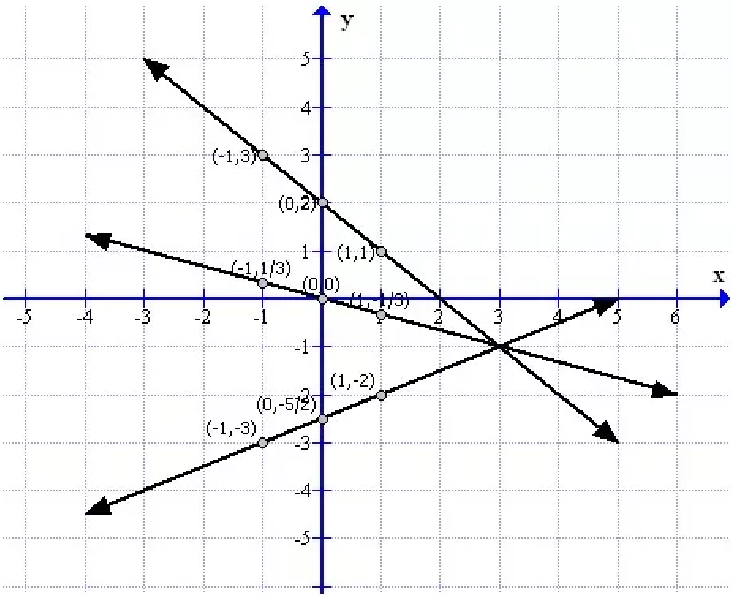
$$y = \frac{1}{2}(x - 5)$$

$$y = -\frac{x}{3}$$

First prepare a table as follows:

x	y = 2 - x	$y = \frac{1}{2}(x-5)$	$y = -\frac{x}{3}$
-1	3	-3	$\frac{1}{3}$
0	2	$-\frac{5}{2}$	0
1	1	-2	$-\frac{1}{3}$

Thus the graph can be drawn as follows:



From the graph it is clear that the equation of lines are passes through the same point.

Exercise 26(C)

Solution 1:

The angle which a straight line makes with the positive direction of x-axis (measured in anticlockwise direction) is called inclination o the line.

The inclination of a line is usually denoted by θ

(i)The inclination is $\theta = 45°$

(ii) The inclination is $\theta = 135°$

(iii) The inclination is $\theta = 30°$

Solution 2:

(i)The inclination of a line parallel to x-axis is $\theta = 0°$

(ii)The inclination of a line perpendicular to x-axis is $\theta = 90°$

(iii) The inclination of a line parallel to y-axis is $\theta = 90°$

(iv) The inclination of a line perpendicular to y-axis is $\theta = 0°$

Solution 3:

If θ is the inclination of a line; the slope of the line is tan θ and is usually denoted by letter m.

(i)Here the inclination of a line is 0°, then θ = 0°

Therefore the slope of the line is m = tan 0° = 0

(ii)Here the inclination of a line is 30°, then θ = 30°

Therefore the slope of the line is m = tan θ = 30° = $\frac{1}{\sqrt{3}}$

(iii)Here the inclination of a line is 45° , then θ = 45°

Therefore the slope of the line is m = tan 45° = 1

(iv)Here the inclination of a line is 60°, then θ = 60°

Therefore the slope of the line is m = tan 60° = √3

Solution 4:

If tan θ is the slope of a line; then inclination of the line is tan θ

(i)Here the slope of line is 0; then tan θ = 0

Now

$$\tan\theta = 0$$
$$\tan\theta = \tan 0^0$$
$$\theta = 0^0$$

Therefore the inclination of the given line is θ = 0°

(ii)Here the slope of line is 1; then tan θ = 1

Now

$$\tan\theta = 1$$
$$\tan\theta = \tan 45^0$$
$$\theta = 45^0$$

Therefore the inclination of the given line is θ = 45°

(iii)Here the slope of line is $\sqrt{3}$; then tan θ = √3

Now

$$\tan\theta = \sqrt{3}$$
$$\tan\theta = \tan 60^0$$
$$\theta = 60^0$$

Therefore the inclination of the given line is θ = 60°

(iv)Here the slope of line is $\frac{1}{\sqrt{3}}$; then $\tan\theta = \frac{1}{\sqrt{3}}$

Now

$$\tan\theta = \frac{1}{\sqrt{3}}$$
$$\tan\theta = \tan 30^0$$
$$\theta = 30^0$$

Therefore the inclination of the given line is θ = 30°

Solution 5:

(i)For any line which is parallel to x-axis, the inclination is $\theta = 0°$

Therefore, Slope(m) = $\tan\theta = \tan 0° = 0$

(ii) For any line which is perpendicular to x-axis, the inclination is $\theta = 90°$

Therefore, Slope(m) = $\tan\theta = \tan 90° = \infty$(not defined)

(iii) For any line which is parallel to y-axis, the inclination is $\theta = 90°$

Therefore, Slope(m) = $\tan\theta = \tan 90° = \infty$(not defined)

(iv) For any line which is perpendicular to y-axis, the inclination is $\theta = 0°$

Therefore, Slope(m) = $\tan\theta = \tan 0° = 0$

Solution 6:

Equation of any straight line in the form y = mx + c, where slope = m(co-efficient of x) and y-intercept = c(constant term)

(i) $x+3y+5=0$

$$\begin{aligned}
x+3y+5&=0\\
3y&=-x-5\\
y&=\frac{-x-5}{3}\\
y&=\frac{-1}{3}x+\left(-\frac{5}{3}\right)
\end{aligned}$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = -\frac{1}{3}$$

$$\text{y-intercept} = \text{constant term} = -\frac{5}{3}$$

(ii) $3x-y-8=0$

$$\begin{aligned}
3x-y-8&=0\\
-y&=-3x+8\\
y&=3x+(-8)
\end{aligned}$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = 3$$

$$\text{y-intercept} = \text{constant term} = -8$$

(iii) $5x = 4y+7$

$$5x = 4y + 7$$
$$4y = 5x - 7$$
$$y = \frac{5x-7}{4}$$
$$y = \frac{5}{4}x + \left(-\frac{7}{4}\right)$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = \frac{5}{4}$$

$$\text{y-intercept} = \text{constant term} = -\frac{7}{4}$$

(iv) $x = 5y - 4$

$$x = 5y - 4$$
$$5y = x + 4$$
$$y = \frac{x+4}{5}$$
$$y = \frac{1}{5}x + \frac{4}{5}$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = \frac{1}{5}$$

$$\text{y-intercept} = \text{constant term} = \frac{4}{5}$$

(v) $y = 7x - 2$

$$y = 7x - 2$$
$$y = 7x + (-2)$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = 7$$

$$\text{y-intercept} = \text{constant term} = -2$$

(vi) $3y = 7$

$$3y = 7$$
$$3y = 0 \cdot x + 7$$
$$y = \frac{0}{7}x + \frac{7}{3}$$
$$y = 0 \cdot x + \frac{7}{3}$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = 0$$

$$\text{y-intercept} = \text{constant term} = \frac{7}{3}$$

(vii) $4y + 9 = 0$

$$4y + 9 = 0$$
$$4y = 0 \cdot x - 9$$
$$y = \frac{0}{4}x - \frac{9}{4}$$
$$y = 0 \cdot x + \left(-\frac{9}{4}\right)$$

Therefore,

$$\text{slope} = \text{co-efficient of } x = 0$$

$$\text{y-intercept} = \text{constant term} = -\frac{9}{4}$$

Solution 7:

(i)Given

Slope is 2, therefore m = 2

Y-intercept is 3, therefore c = 3

Therefore,

$$y = mx + c$$
$$y = 2x + 3$$

Therefore the equation of the required line is y = 2x + 3

(ii)Given

Slope is 5, therefore m = 5

Y-intercept is -8, therefore c = -8

Therefore,

$$y = mx + c$$
$$y = 5x + -8$$

Therefore the equation of the required line is y = 5x + (-8)

(iii)Given

Slope is -4, therefore m = -4

Y-intercept is 2, therefore c = 2

Therefore,

$$y = mx + c$$
$$y = -4x + 2$$

Therefore the equation of the required line is y = -4x + 2

(iv)Given

Slope is -3, therefore m = -3

Y-intercept is -1, therefore c = -1

Therefore,

$$y = mx + c$$
$$y = -3x - 1$$

Therefore the equation of the required line is y = -3x - 1

(v)Given

Slope is 0, therefore m = 0

Y-intercept is -5, therefore c = -5

Therefore,

$$y = mx + c$$
$$y = 0 \cdot x + (-5)$$
$$y = -5$$

Therefore the equation of the required line is y = -5

(vi)Given

Slope is 0, therefore m = 0

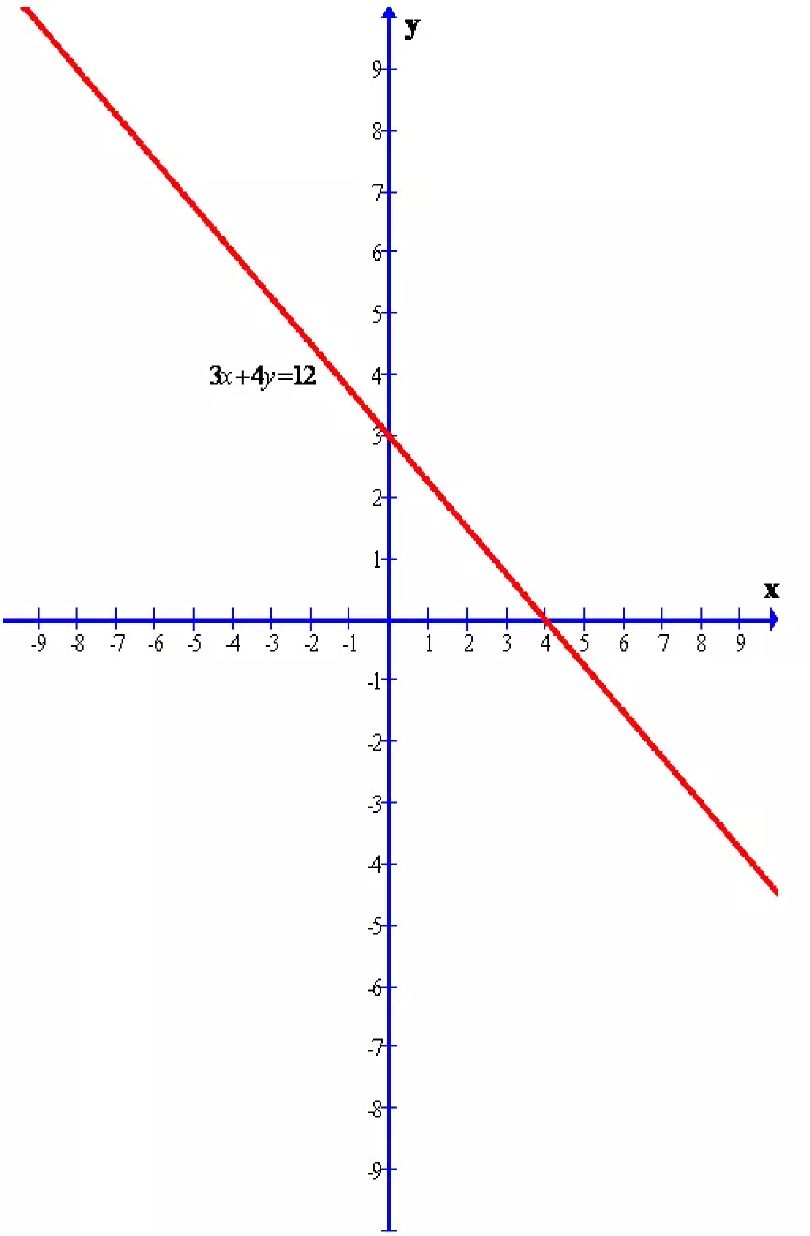
Y-intercept is 0, therefore c = 0

Therefore,

$$y = mx + c$$
$$y = 0 \cdot x + 0$$
$$y = 0$$

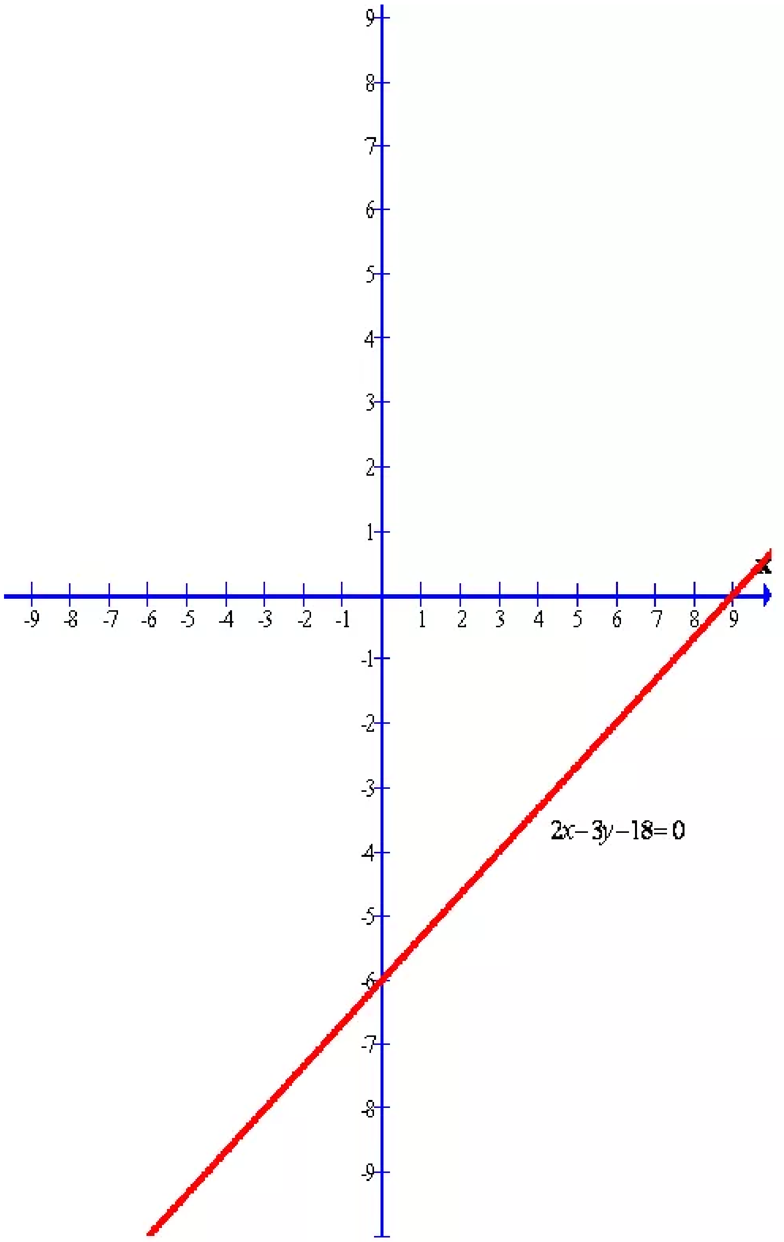
Therefore the equation of the required line is y = 0

Solution 8:
Given line is 3x + 4y = 12
The graph of the given line is shown below.



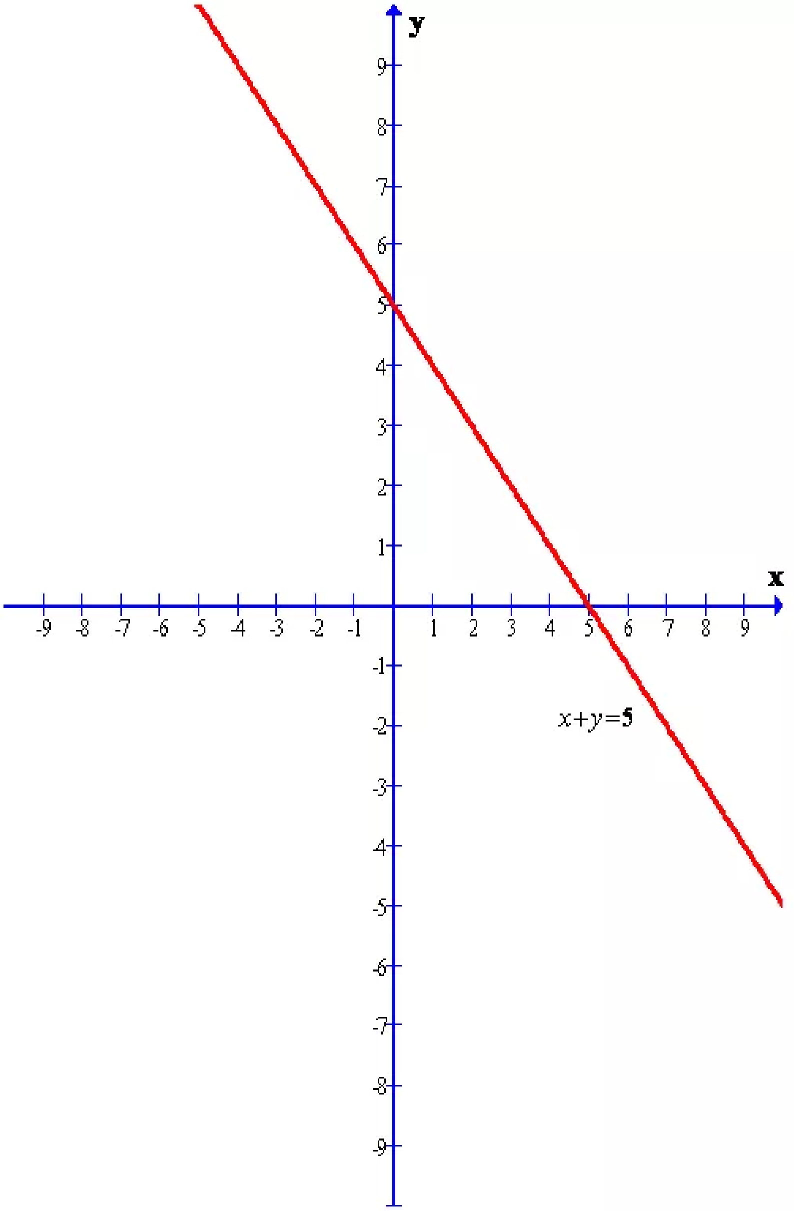
Clearly from the graph we can find the y-intercept.
The required y-intercept is 3.

Solution 9:
Given line is
2x − 3y − 18 = 0
The graph of the given line is shown below.



Clearly from the graph we can find the y-intercept.
The required y-intercept is -6

Solution 10:
Given line is
x + y = 5
The graph of the given line is shown below.



From the given line x + y = 5, we get

$$x + y = 5$$
$$y = -x + 5$$
$$y = (-1) \cdot x + 5 \text{ ...... (A)}$$

Again we know that equation of any straight line in the form y = mx + c, where m is the gradient and c is the intercept. Again we have if slope of a line is tan θ then inclination of the line is θ

Now from the equation (A) , we have

$$m = -1$$
$$\tan\theta = -1$$
$$\tan\theta = \tan 135^0$$
$$\theta = 135^0$$

And c = 5

Therefore the required inclination is θ = 135° and y-intercept is c = 5