

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

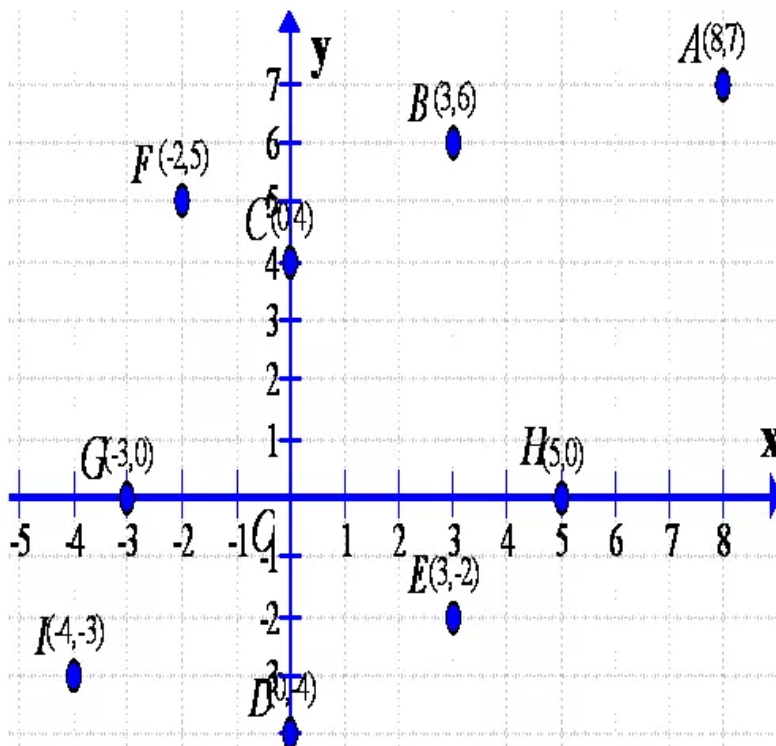
Starting from origin O , move 8 units along the positive direction of X axis, to the right of the origin O

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.

⇒ Therefore their first components are equal and their second components too are separately equal.

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

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

$$x-1=4 \text{ and } y+3=4$$

$$x=5 \text{ and } y=1$$

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

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

$$3x+1=9 \text{ and } 2y-7=-9$$

$$3x=8 \text{ and } 2y=-2$$

$$x=\frac{8}{3} \text{ and } y=-1$$

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

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

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

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

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

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

$$\frac{15-4b}{7} = \frac{2b-1}{3}$$

$$45-12b = 14b-7$$

$$45+7 = 14b+12b$$

$$52 = 26b$$

$$2 = b$$

∴ 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

$$4-3y = \frac{4+y}{3}$$

$$12-9y = 4+y$$

$$12-4 = y+9y$$

$$8 = 10y$$

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

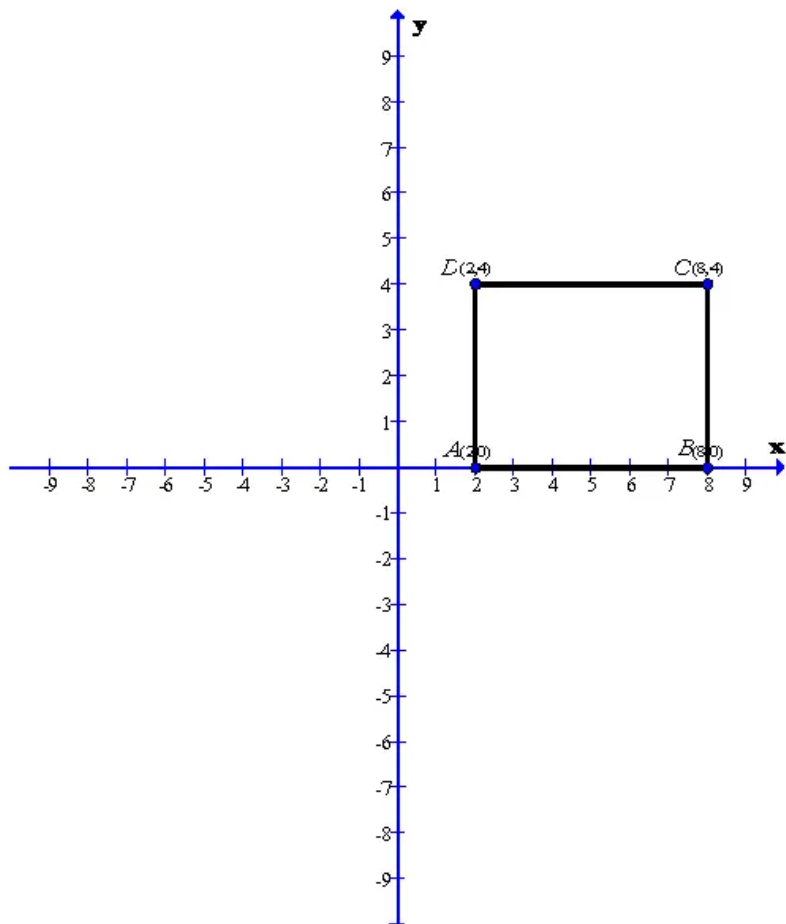
$$\frac{4}{5} = y$$

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



Solution 7:

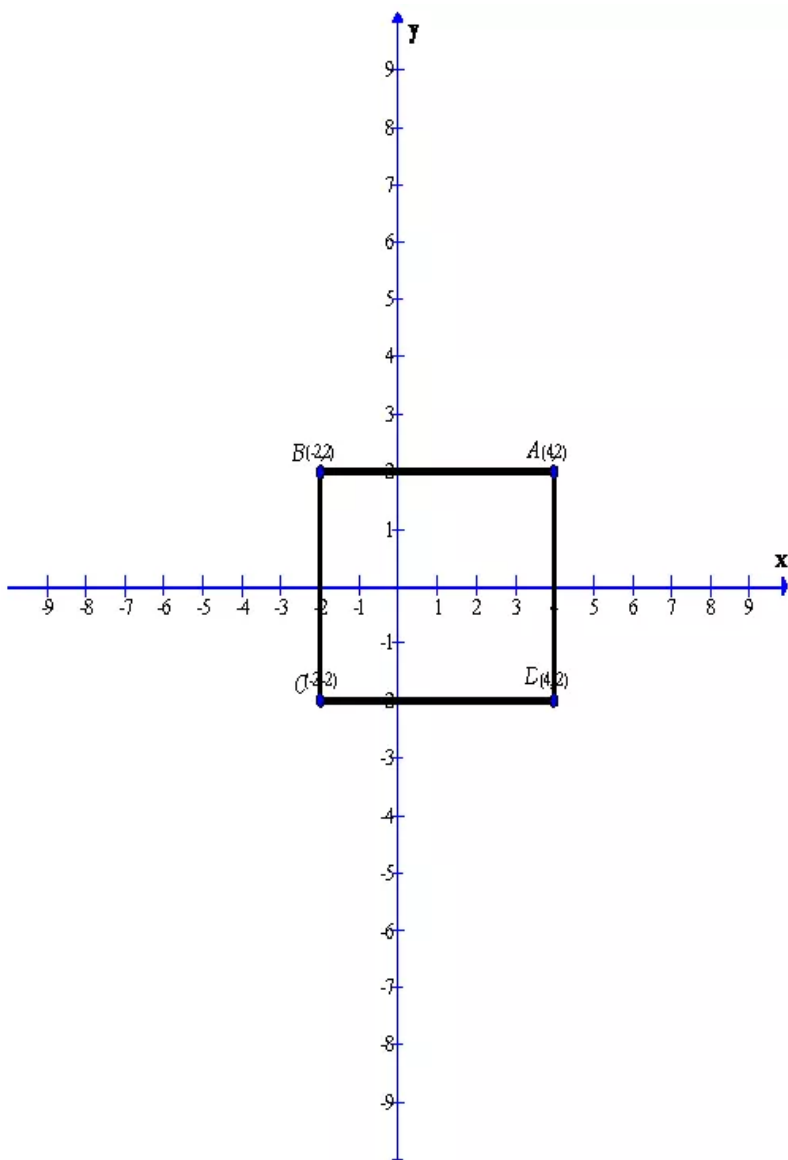
(i) $A(2,0)$, $B(8,0)$ and $C(8,4)$



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

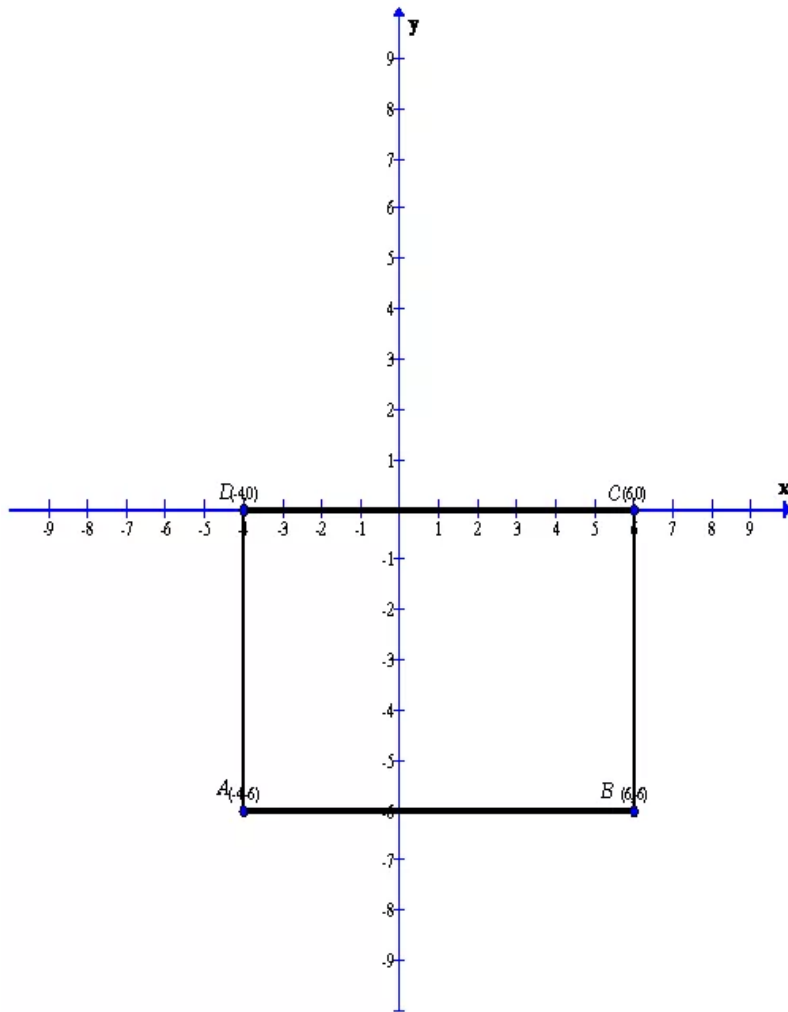
As is clear from the graph $D(2,4)$

(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 $C(-2,-2)$

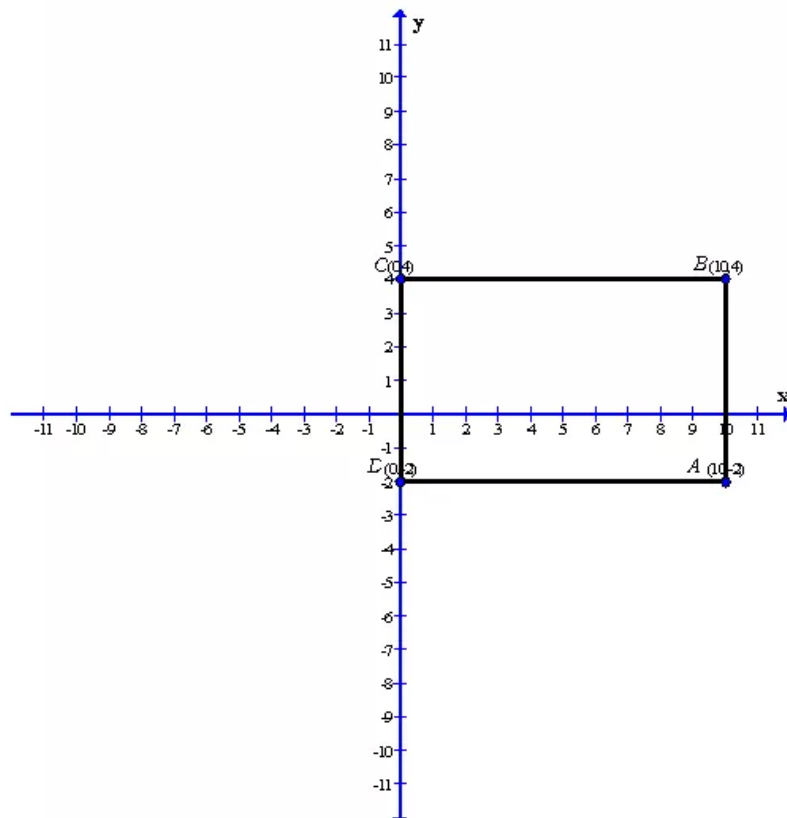
(iii) $A(-4, -6)$, $C(6, 0)$ and $D(-4, 0)$



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 $D(0,-2)$

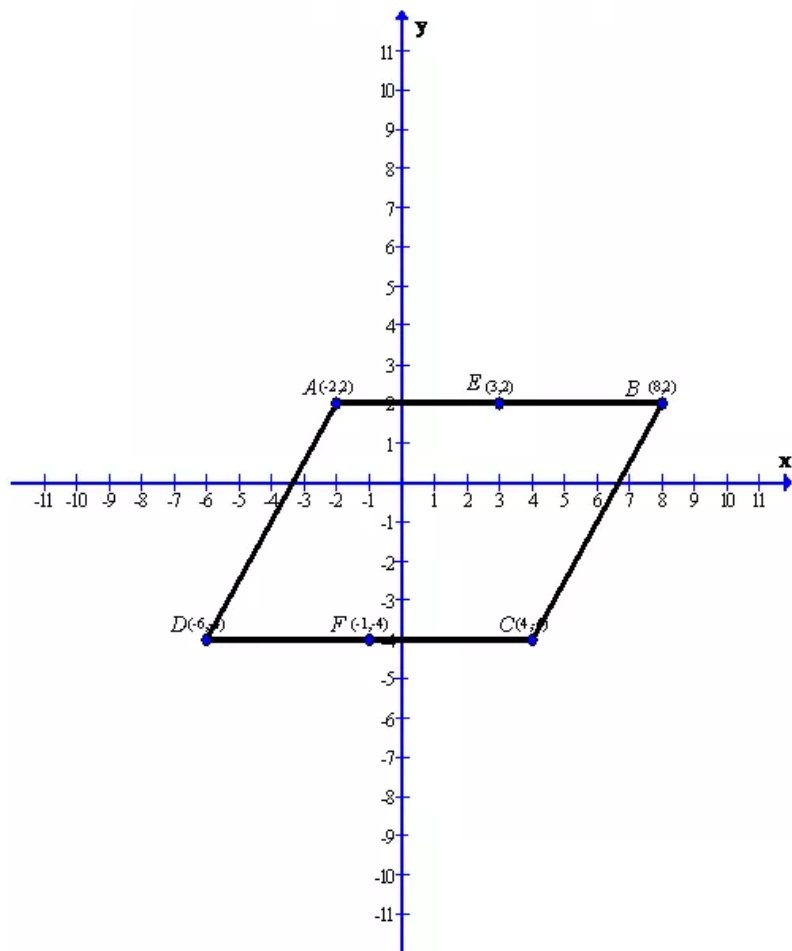


After plotting the given points $B(10,4)$, $C(0,4)$ and $D(0,-2)$ on a graph paper; joining C with B and C with D . From the graph it is clear that the vertical distance between the points $C(0,4)$ and $D(0,-2)$ is 6 units and the horizontal distance between the points $C(0,4)$ and $B(10,4)$ is 10 units,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

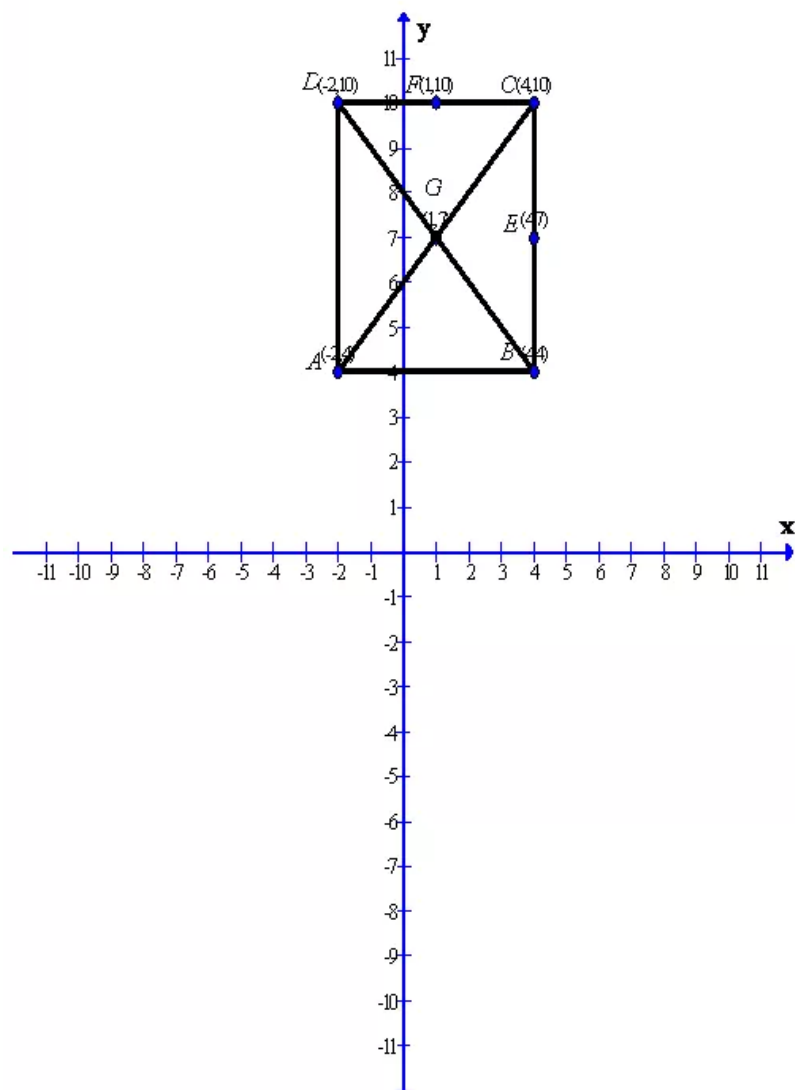
As is clear from the graph $D(-6,4)$

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 $ABCD$



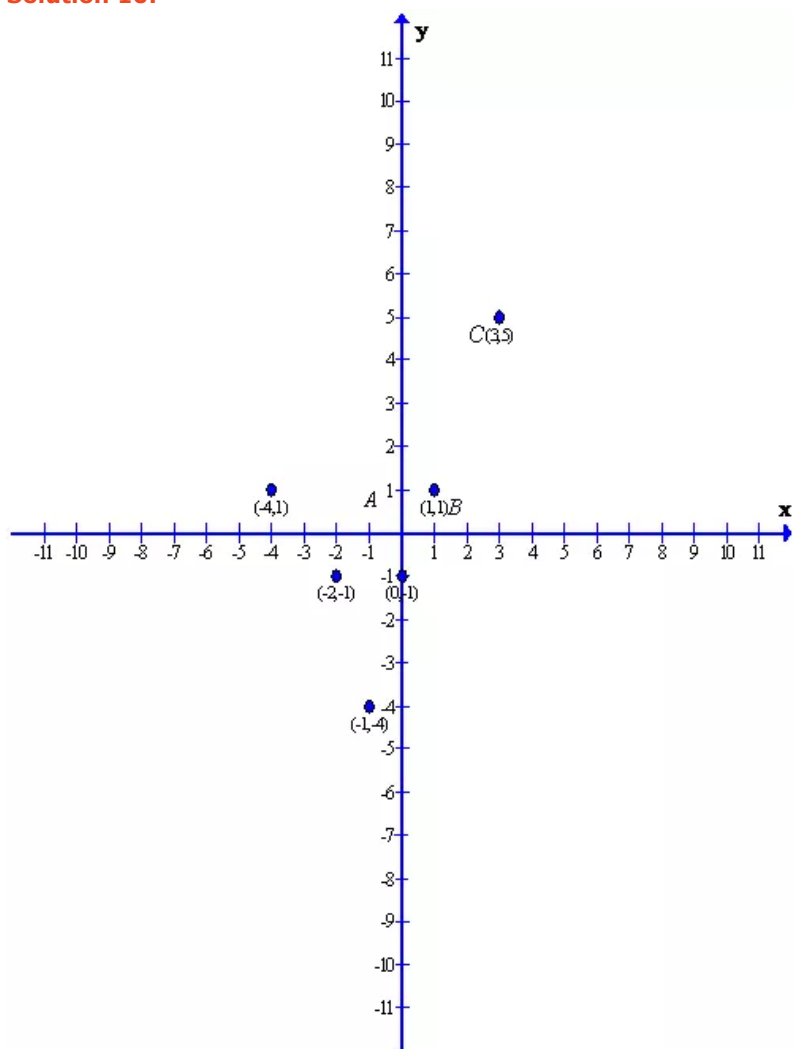
After plotting the given points $A(-2,4)$, $C(4,10)$ and $D(-2,10)$ on a graph paper; joining D with A and D with C . Now complete the square $ABCD$

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:

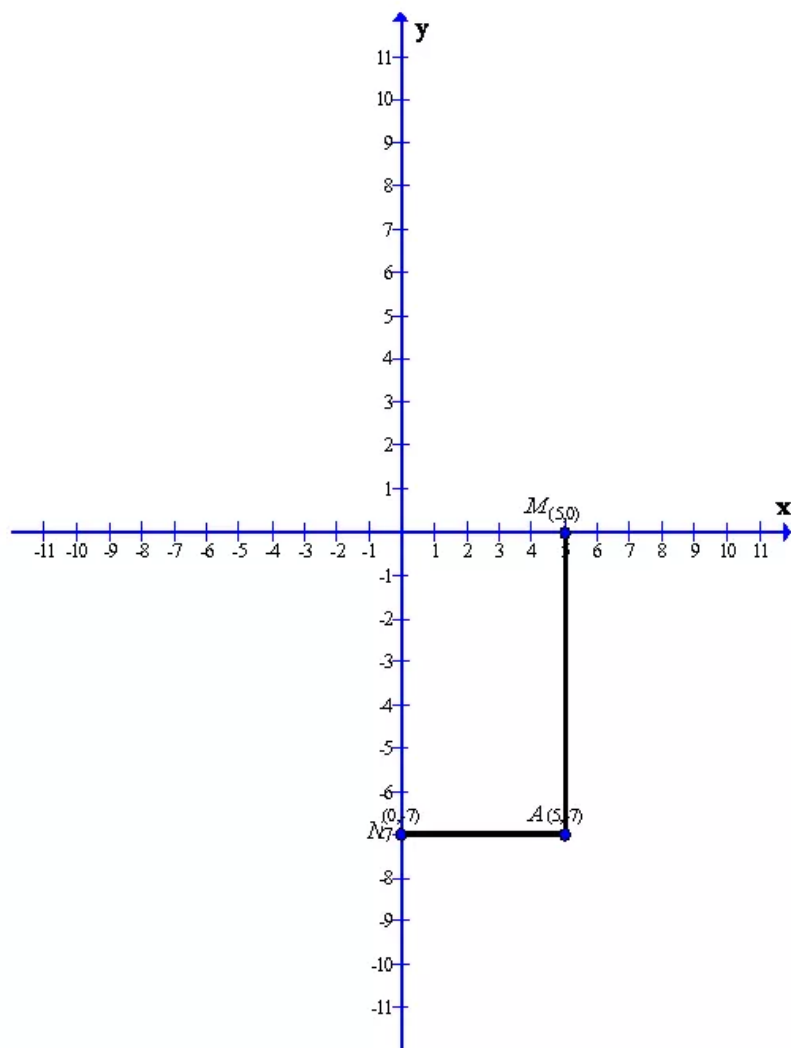


After plotting the given points, we have clearly seen from the graph that

- (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.

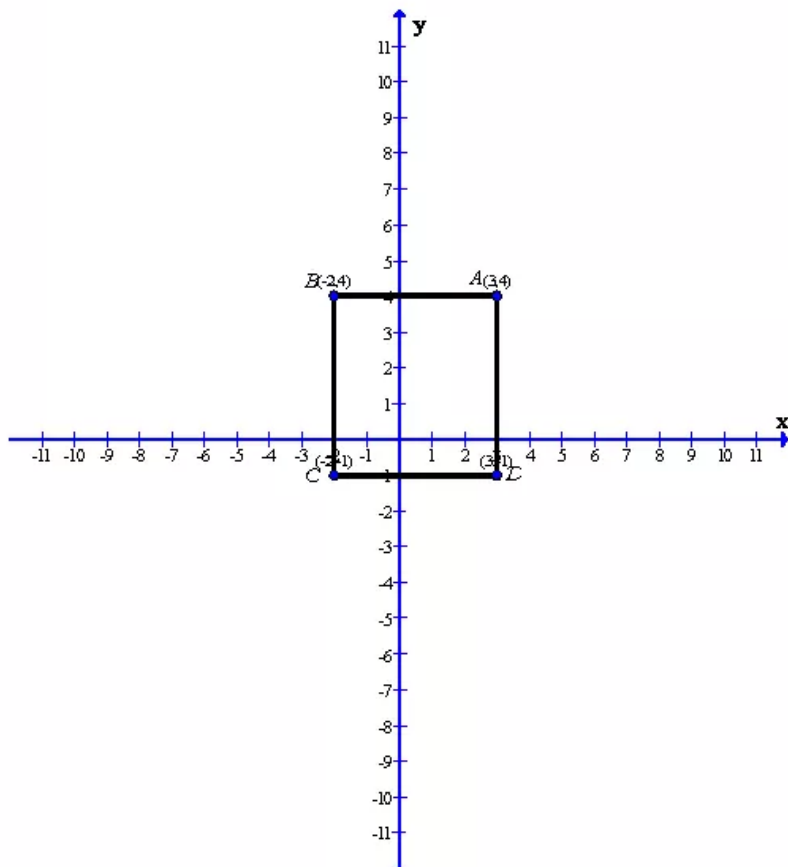
As from the graph clearly we get the co-ordinates of the points M and N

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:**

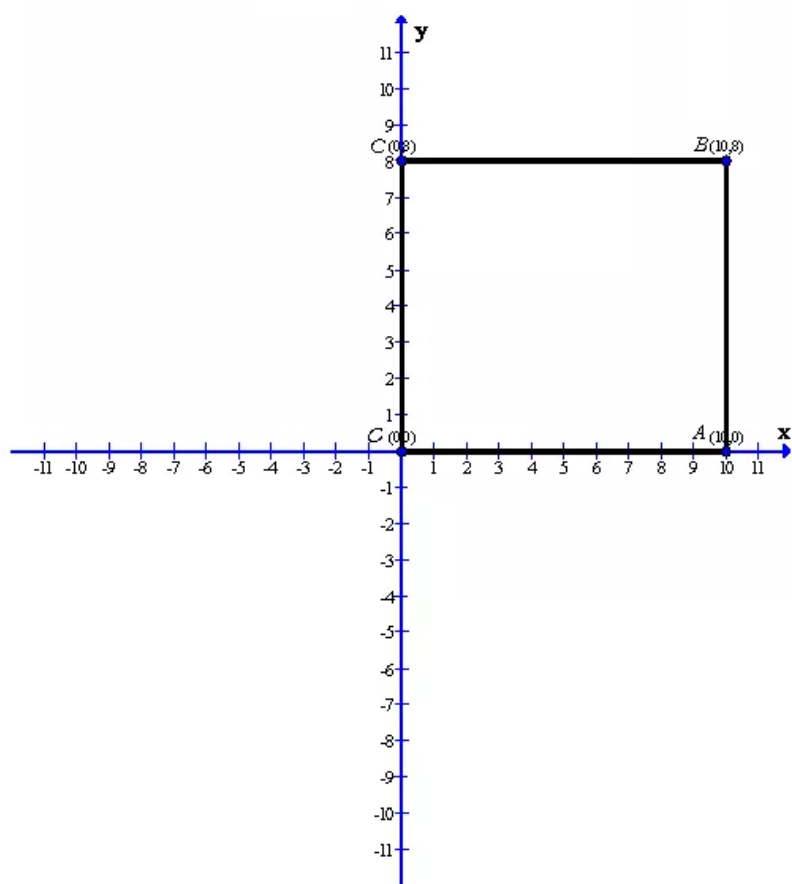
After plotting the given points $A(3,4)$, $B(-2,4)$ and $C(-2,-1)$ on a graph paper; joining B with C and B with A . From the graph it is clear that the vertical distance between the points $B(-2,4)$ and $C(-2,-1)$ is 5 units and the horizontal distance between the points $B(-2,4)$ and $A(3,4)$ is 5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

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

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 coordinates of the vertices are $A(10,0)$, $B(10,8)$ and $C(0,8)$

Exercise 26(B)

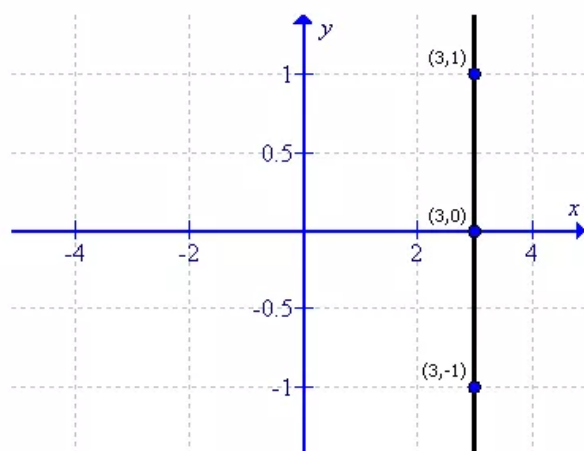
Solution 1:

(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:

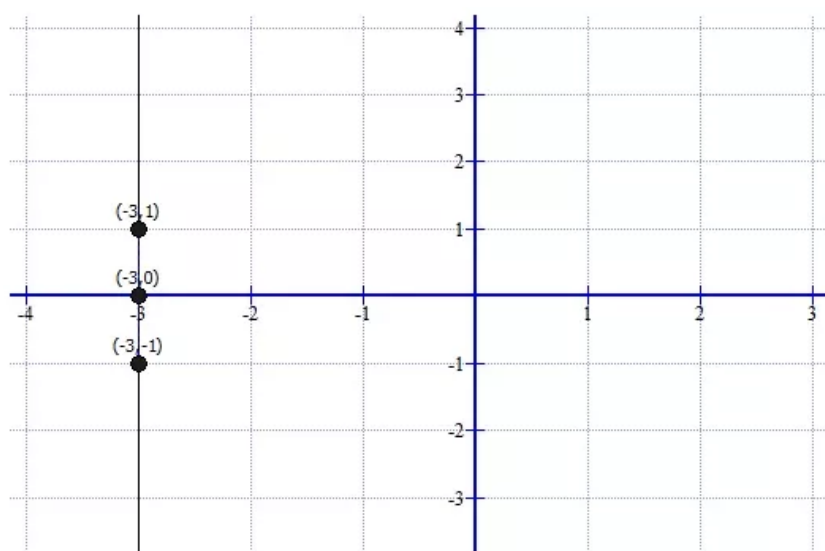


(ii)

First prepare a table as follows:

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

Thus the graph can be drawn as follows:

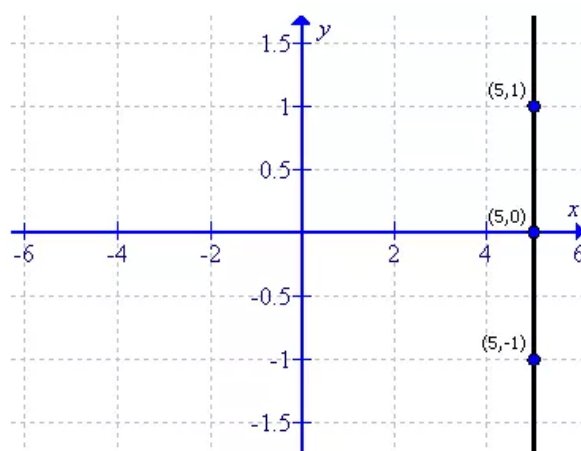


(iii)

First prepare a table as follows:

x	5	5	5
y	-1	0	1

Thus the graph can be drawn as follows:



(iv)

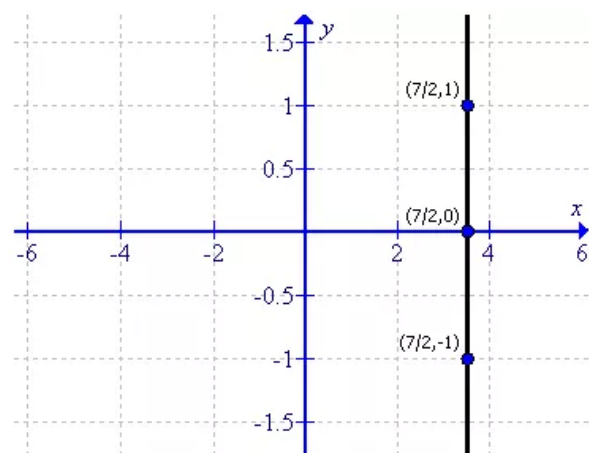
The equation can be written as:

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

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:

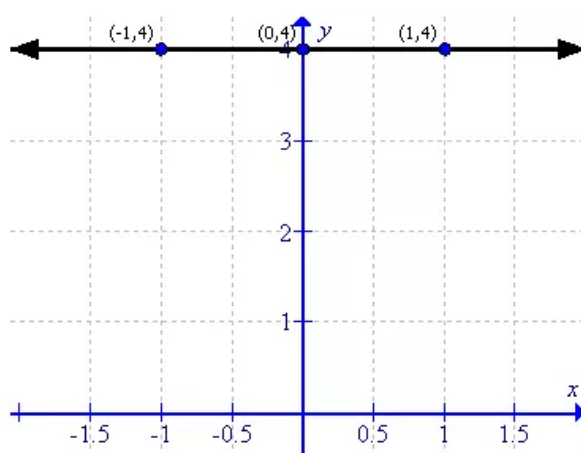


(v)

First prepare a table as follows:

x	-1	0	1
y	4	4	4

Thus the graph can be drawn as follows:

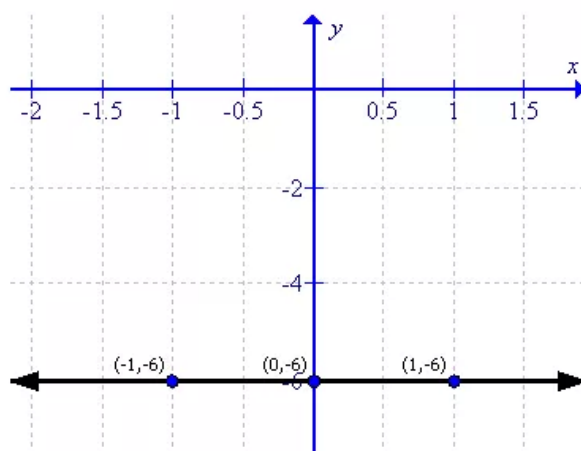


(vi)

First prepare a table as follows:

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

Thus the graph can be drawn as follows:

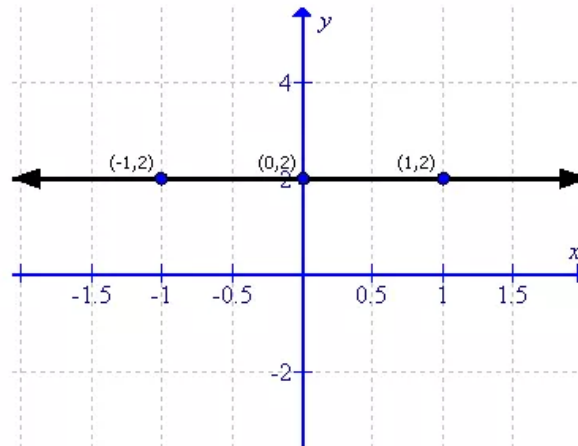


(vii)

First prepare a table as follows:

x	-1	0	1
y	2	2	2

Thus the graph can be drawn as follows:

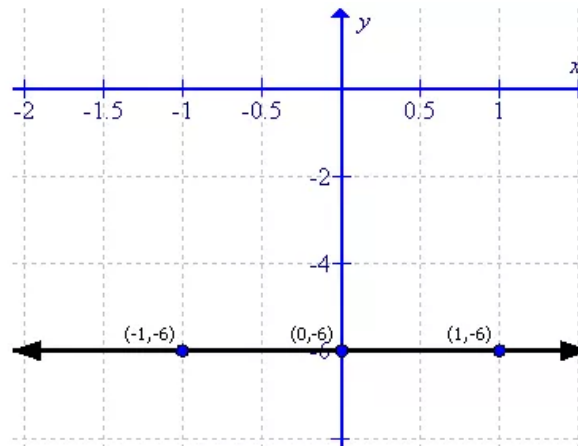


(viii)

First prepare a table as follows:

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

Thus the graph can be drawn as follows:

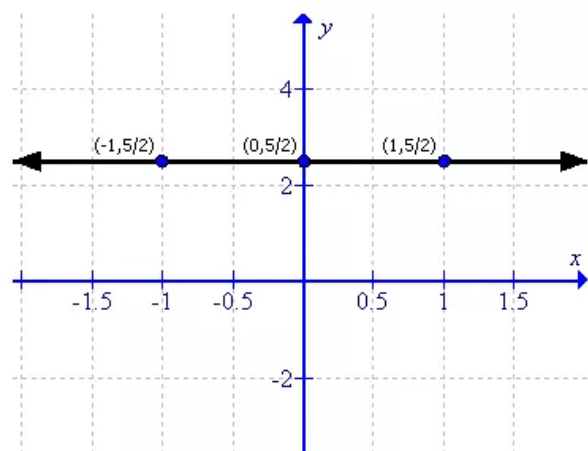


(ix)

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:

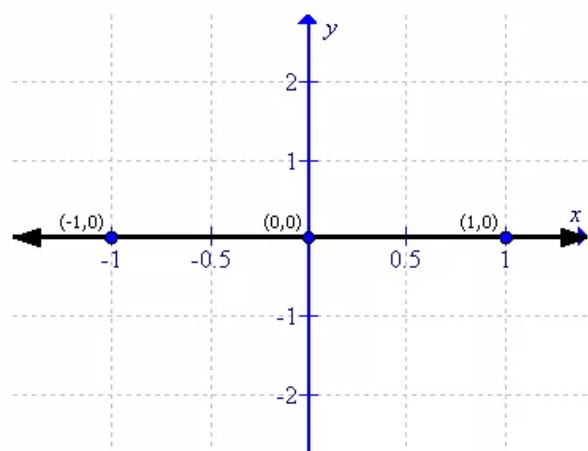


(x)

First prepare a table as follows:

x	-1	0	1
y	0	0	0

Thus the graph can be drawn as follows:

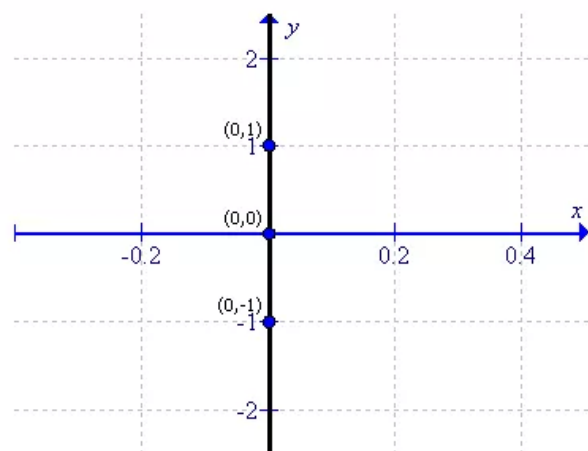


(xi)

First prepare a table as follows:

x	0	0	0
y	-1	0	1

Thus the graph can be drawn as follows:



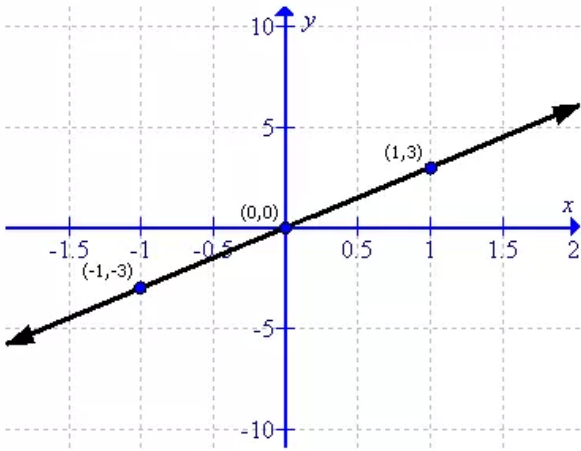
Solution 2:

(i)

First prepare a table as follows:

x	-1	0	1
y	-3	0	3

Thus the graph can be drawn as follows:

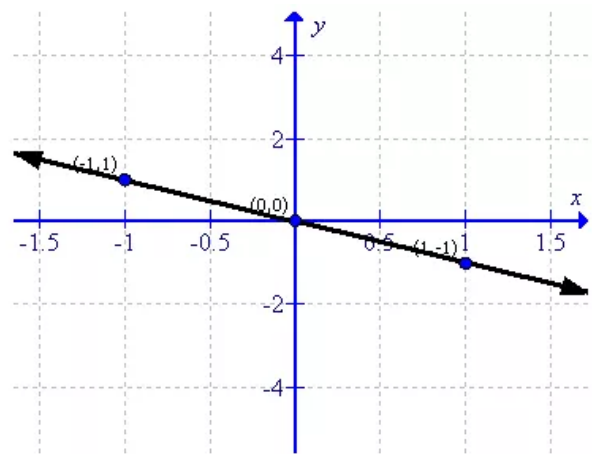


(ii)

First prepare a table as follows:

x	-1	0	1
y	1	0	-1

Thus the graph can be drawn as follows:

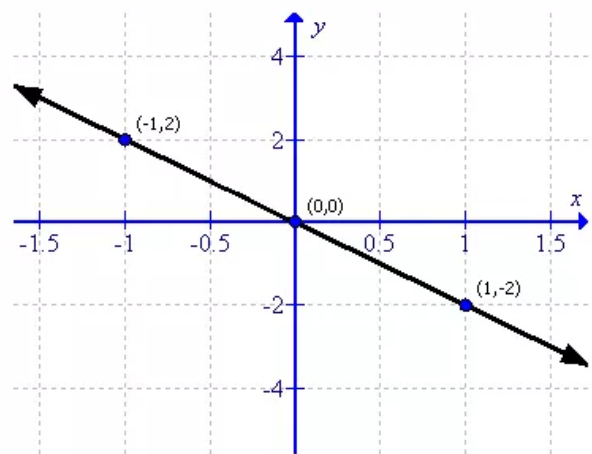


(iii)

First prepare a table as follows:

x	-1	0	1
y	2	0	-2

Thus the graph can be drawn as follows:

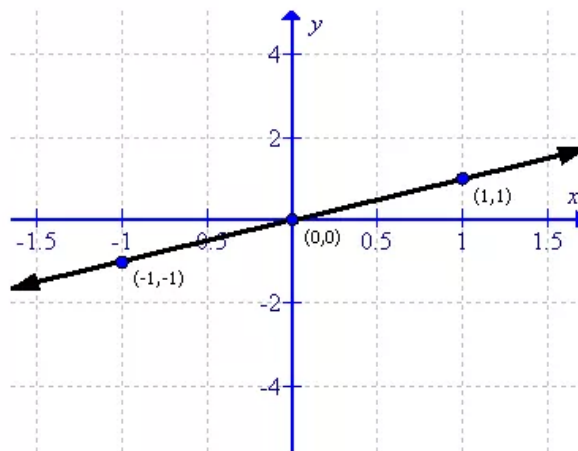


(iv)

First prepare a table as follows:

x	-1	0	1
y	-1	0	1

Thus the graph can be drawn as follows:

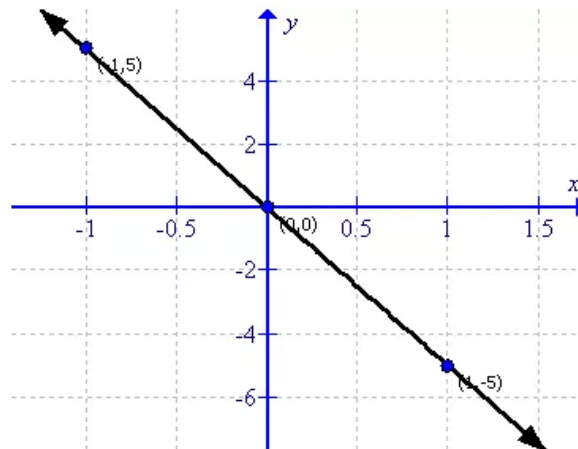


(v)

First prepare a table as follows:

x	-1	0	1
y	5	0	-5

Thus the graph can be drawn as follows:

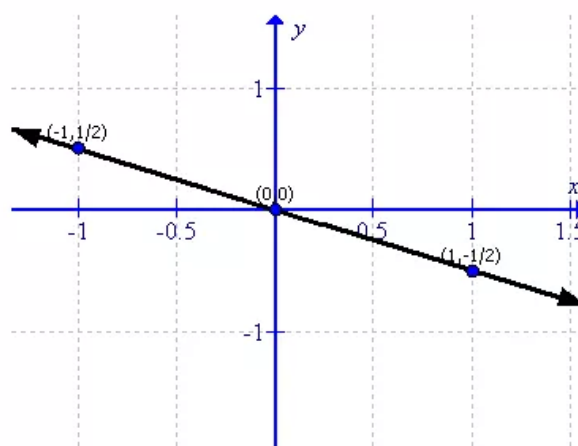


(vi)

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:

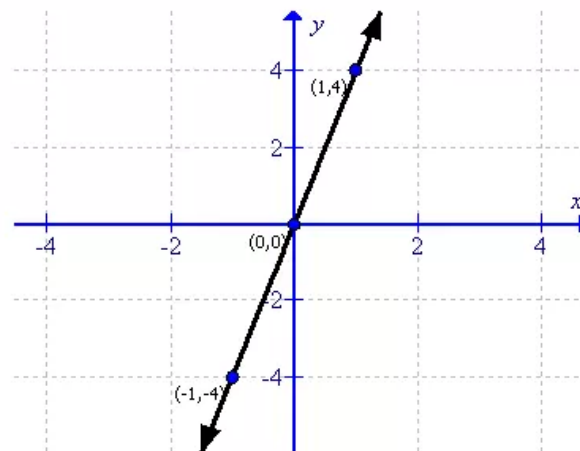


(vii)

First prepare a table as follows:

x	-1	0	1
y	-4	0	4

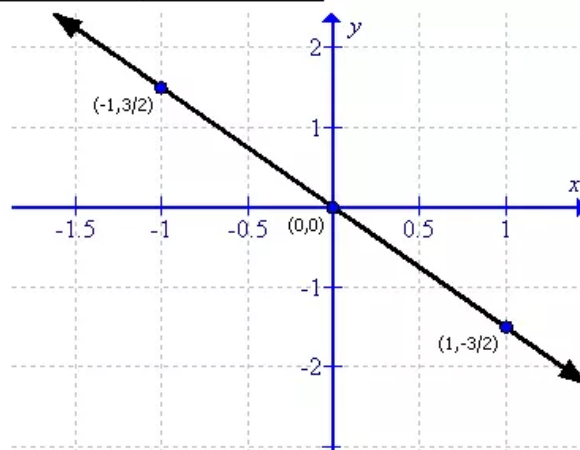
Thus the graph can be drawn as follows:



(viii)

First prepare a table as follows:

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

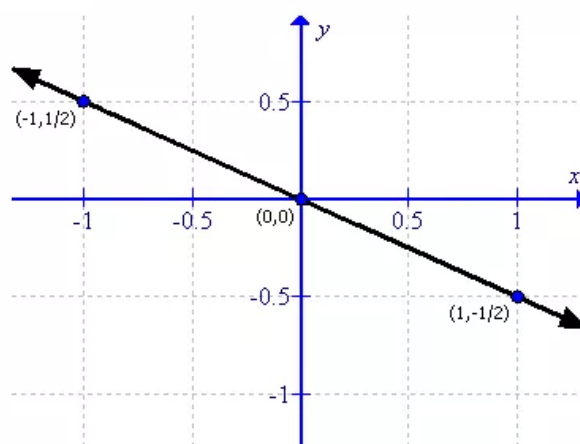


(ix)

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:



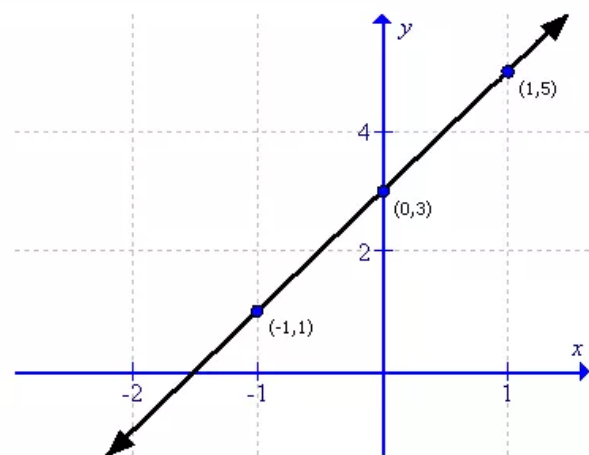
Solution 3:

(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:

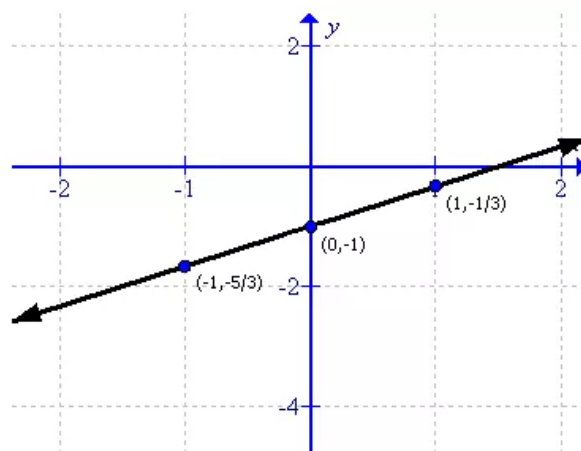


(ii)

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:

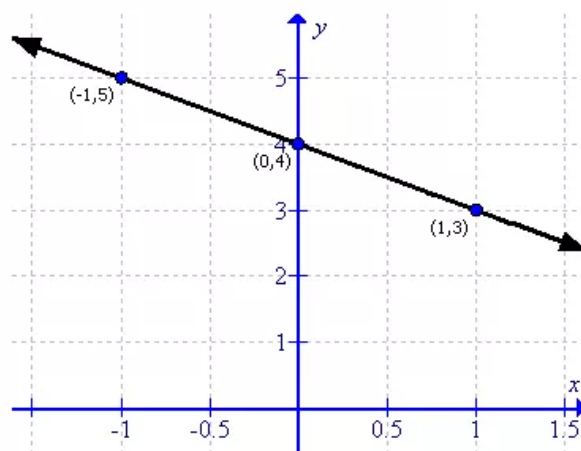


(iii)

First prepare a table as follows:

x	-1	0	1
y	5	4	3

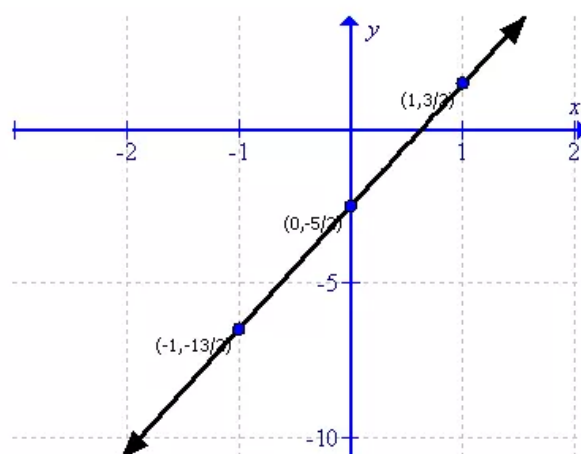
Thus the graph can be drawn as follows:



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:

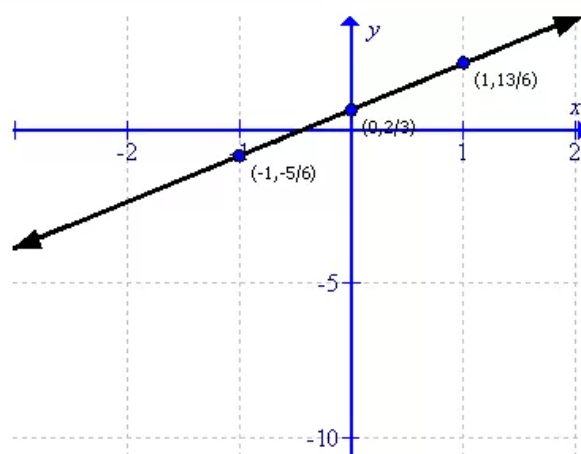


(v)

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:

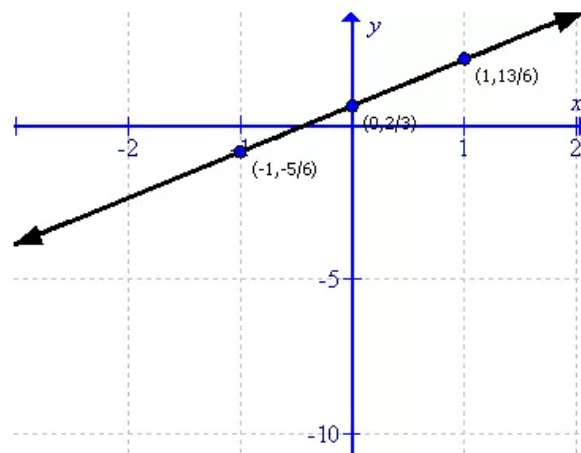


(vi)

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:

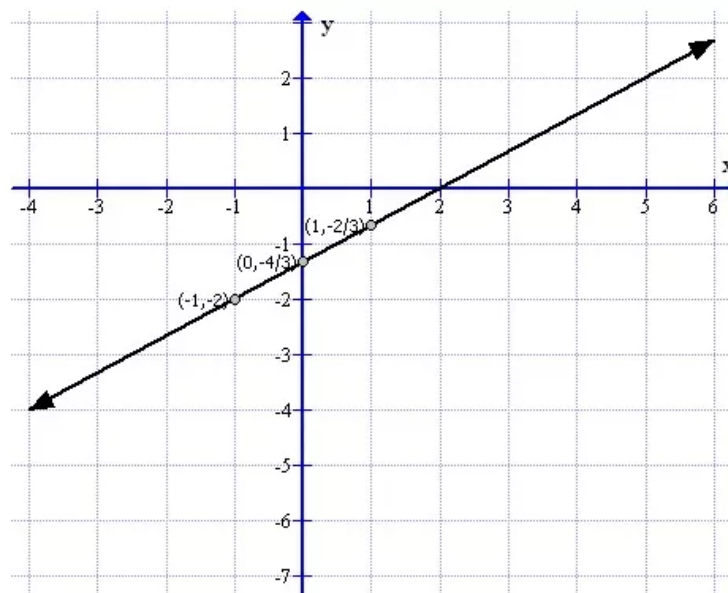


(vi)

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)

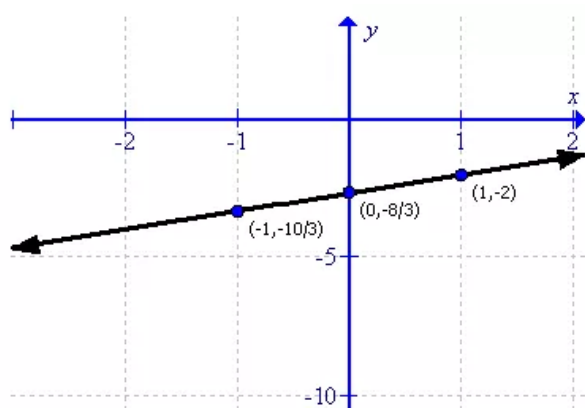
The equation will become:

$$2x - 3y = 8$$

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)

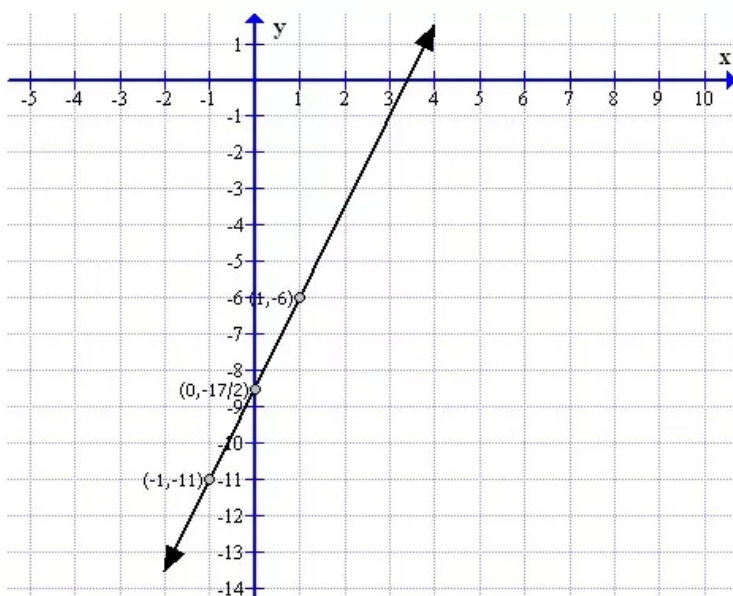
The equation will become:

$$5x - 2y = 17$$

First prepare a table as follows:

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

Thus the graph can be drawn as follows:

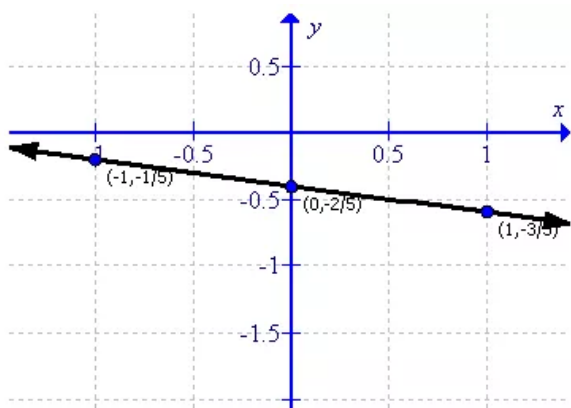


(ix)

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:

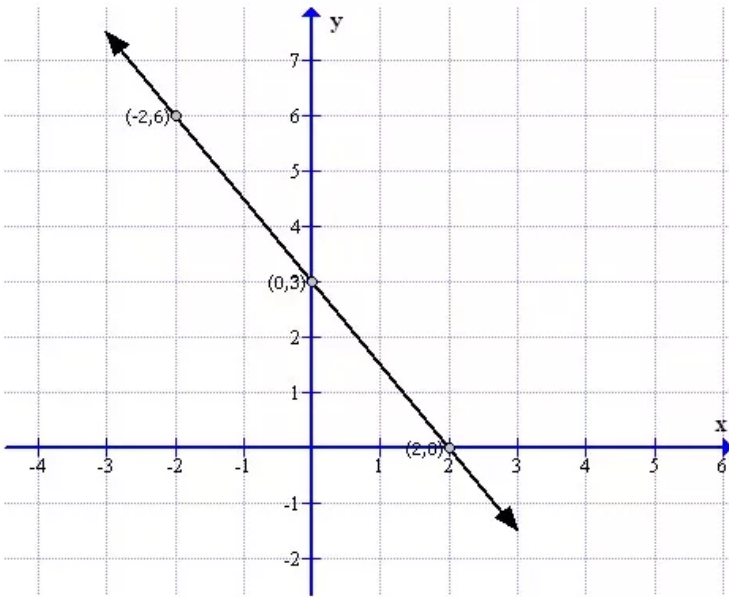
(i)

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).

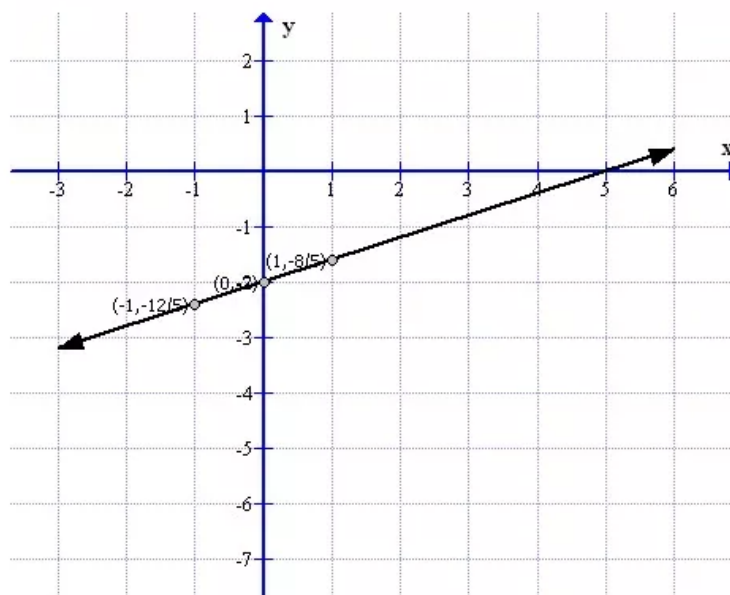
(ii)

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 $(0, -2)$.

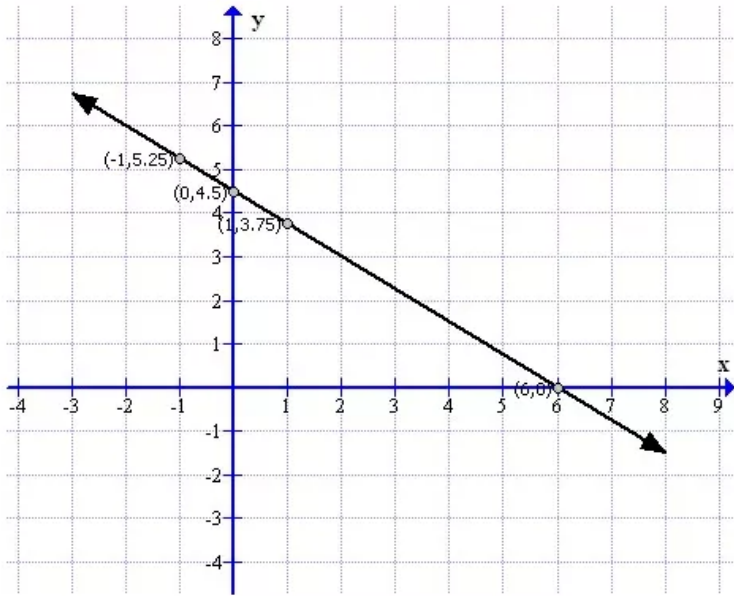
(iii)

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).

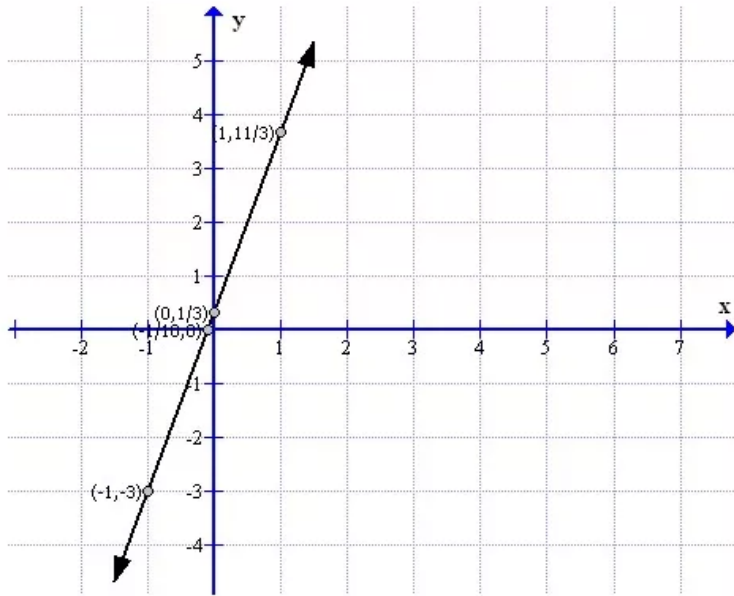
(iv)

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:

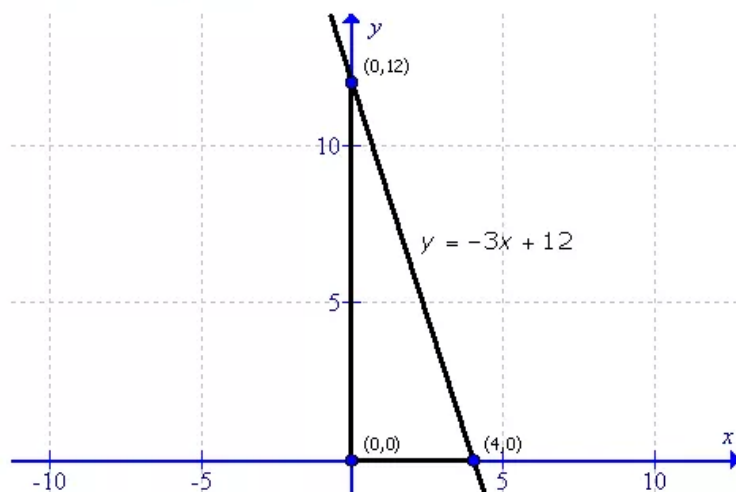


From the graph it can verify that the line intersect x axis at $(-\frac{1}{10}, 0)$ and y at (0,4.5).

Solution 5:

(i)

First draw the graph as follows:



This is an right triangle.

Thus the area of the triangle will be:

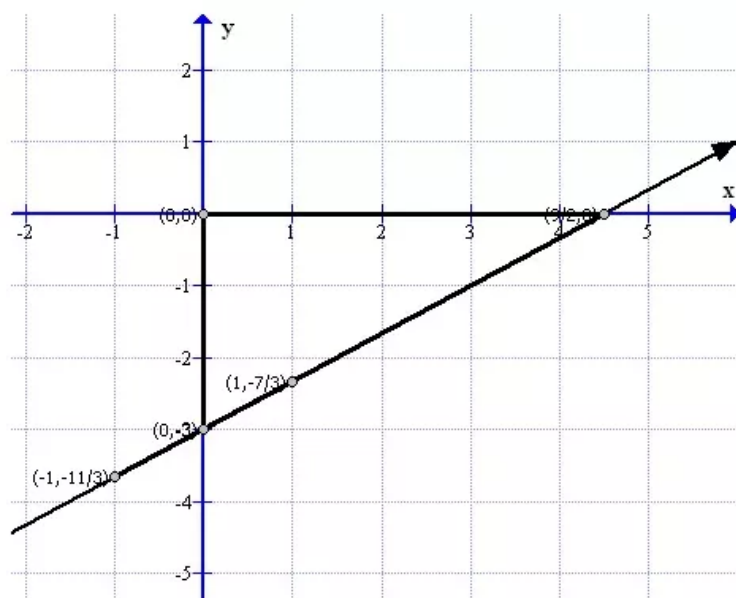
$$= \frac{1}{2} \times \text{base} \times \text{altitude}$$

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

$$= 24 \text{ sq.units}$$

(ii)

First draw the graph as follows:



This is a right triangle.

Thus the area of the triangle will be:

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

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

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

Solution 6:

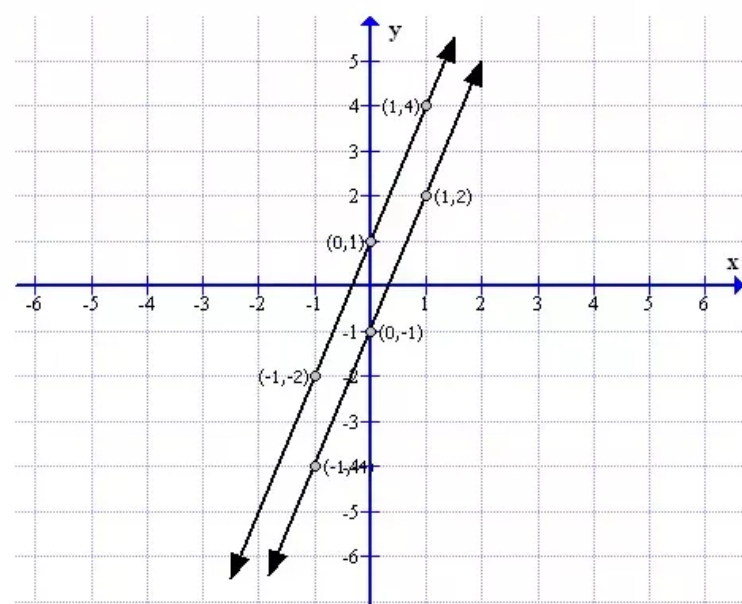
(i)

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.

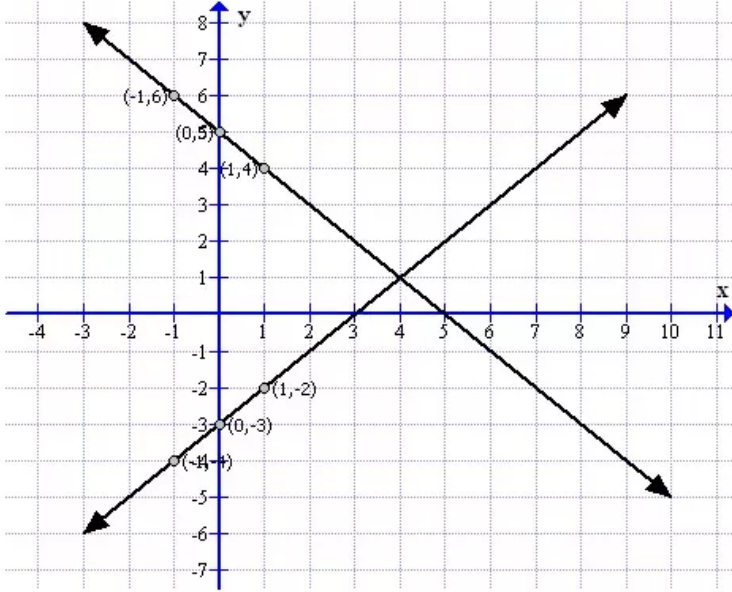
(ii)

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.

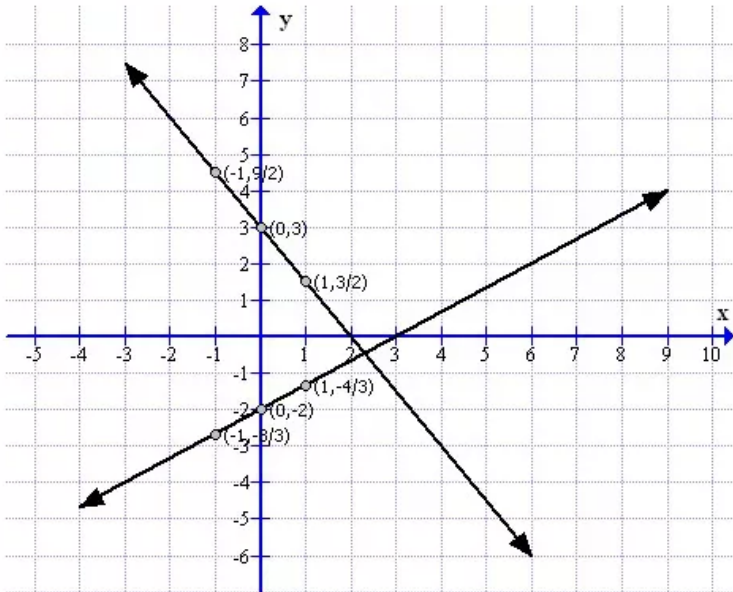
(iii)

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.

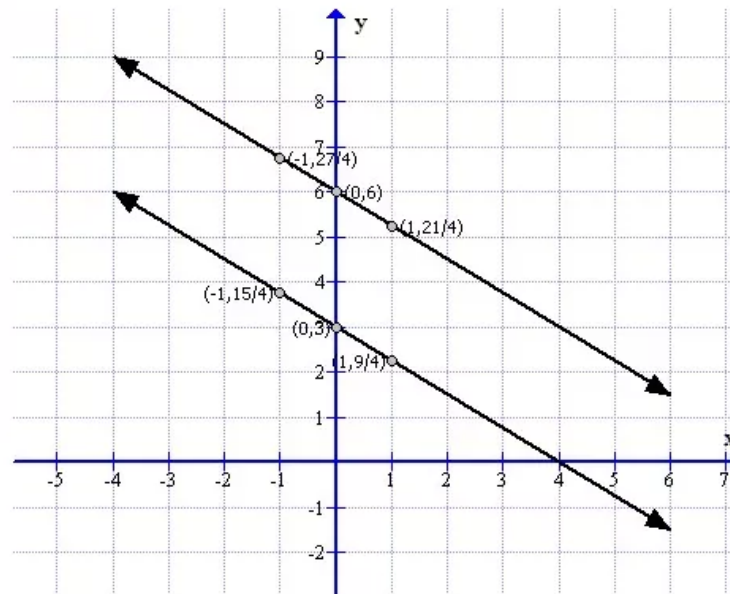
(iv)

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:



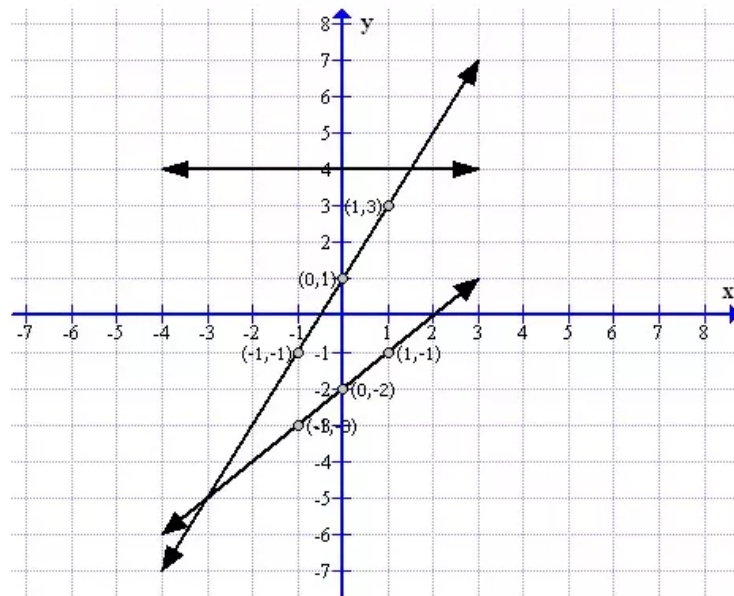
From the graph it can verify that the lines are parallel.

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:

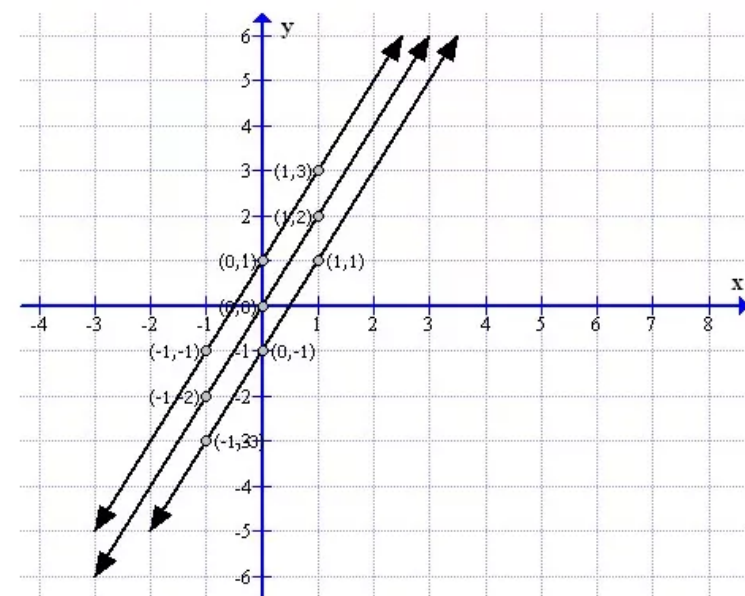


Solution 8:

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.

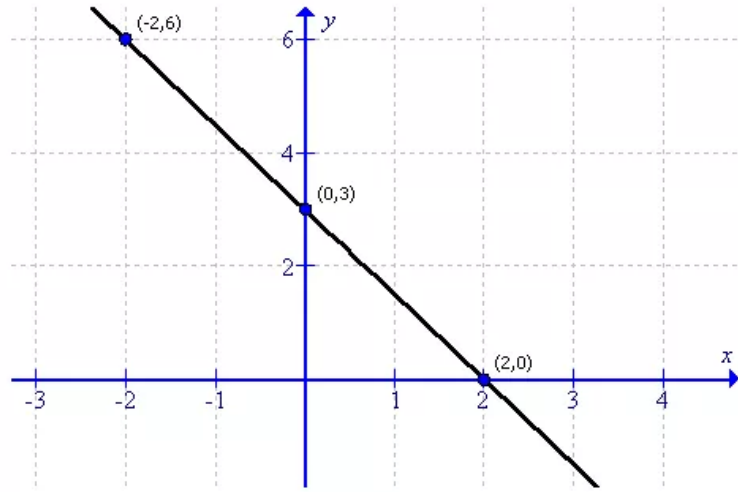
Solution 9:

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:



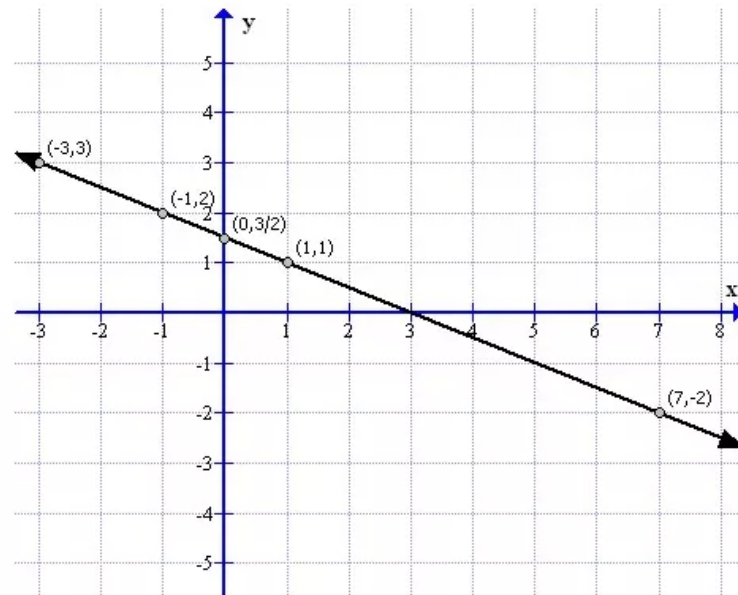
From the graph it can verify that the line intersect x axis at (2,0) and y at (0,3), therefore the co ordinates of P(x-axis) and Q(y-axis) are (2,0) and (0,3) respectively.

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:



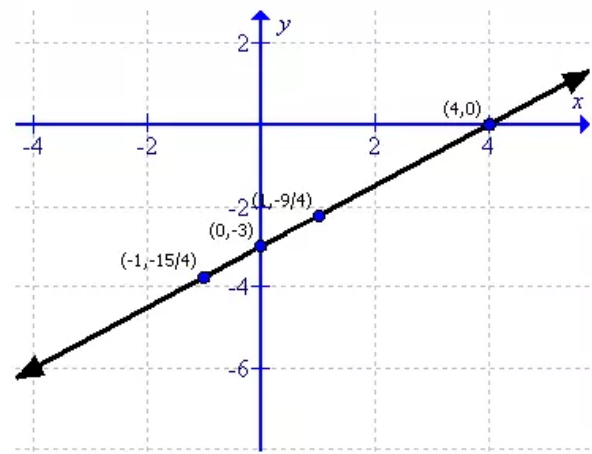
- (i)
For $y = 3$ we have $x = -3$
- (ii)
For $y = -2$ we have $x = 7$

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 $y = 0$

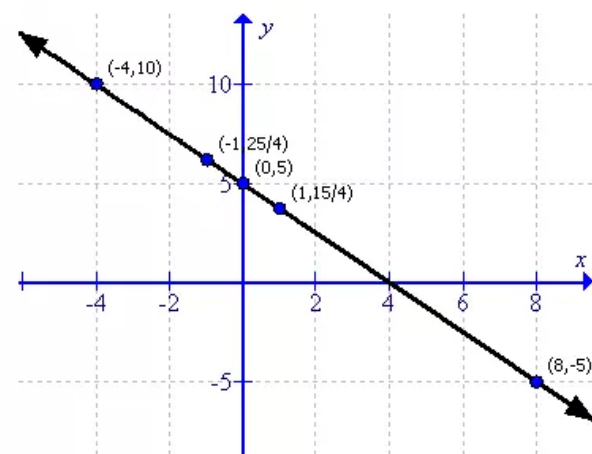
If $x = 0$ the value of $y = -3$.

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:

$$y = 2 - x$$

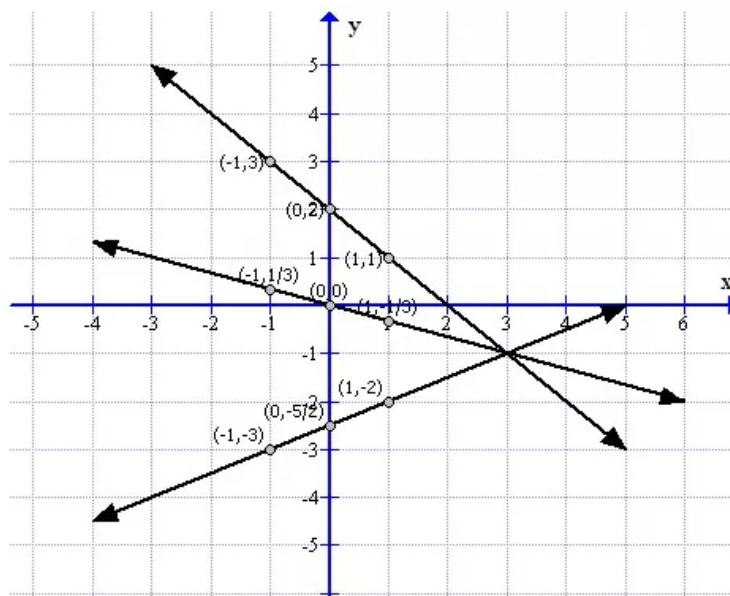
$$y = \frac{1}{2}(x - 5)$$

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

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 $\theta = 45^\circ$

(ii) The inclination is $\theta = 135^\circ$

(iii) The inclination is $\theta = 30^\circ$

Solution 2:

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

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

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

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

Solution 3:

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

(i) Here the inclination of a line is 0° , then $\theta = 0^\circ$

Therefore the slope of the line is $m = \tan 0^\circ = 0$

(ii) Here the inclination of a line is 30° , then $\theta = 30^\circ$

Therefore the slope of the line is $m = \tan \theta = 30^\circ = \frac{1}{\sqrt{3}}$

(iii) Here the inclination of a line is 45° , then $\theta = 45^\circ$

Therefore the slope of the line is $m = \tan 45^\circ = 1$

(iv) Here the inclination of a line is 60° , then $\theta = 60^\circ$

Therefore the slope of the line is $m = \tan 60^\circ = \sqrt{3}$

Solution 4:

If $\tan \theta$ is the slope of a line; then inclination of the line is $\tan \theta$

(i) Here the slope of line is 0; then $\tan \theta = 0$

Now

$$\tan \theta = 0$$

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

$$\theta = 0^\circ$$

Therefore the inclination of the given line is $\theta = 0^\circ$

(ii) Here the slope of line is 1; then $\tan \theta = 1$

Now

$$\tan \theta = 1$$

$$\tan \theta = \tan 45^\circ$$

$$\theta = 45^\circ$$

Therefore the inclination of the given line is $\theta = 45^\circ$

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

Now

$$\tan \theta = \sqrt{3}$$

$$\tan \theta = \tan 60^\circ$$

$$\theta = 60^\circ$$

Therefore the inclination of the given line is $\theta = 60^\circ$

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

Now

$$\tan \theta = \frac{1}{\sqrt{3}}$$

$$\tan \theta = \tan 30^\circ$$

$$\theta = 30^\circ$$

Therefore the inclination of the given line is $\theta = 30^\circ$

Solution 5:

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

Therefore, $\text{Slope}(m) = \tan \theta = \tan 0^\circ = 0$

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

Therefore, $\text{Slope}(m) = \tan \theta = \tan 90^\circ = \infty$ (not defined)

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

Therefore, $\text{Slope}(m) = \tan \theta = \tan 90^\circ = \infty$ (not defined)

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

Therefore, $\text{Slope}(m) = \tan \theta = \tan 0^\circ = 0$

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) $x + 3y + 5 = 0$

$$x + 3y + 5 = 0$$

$$3y = -x - 5$$

$$y = \frac{-x - 5}{3}$$

$$y = \frac{-1}{3}x + \left(-\frac{5}{3}\right)$$

Therefore,

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

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

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

$$3x - y - 8 = 0$$

$$-y = -3x + 8$$

$$y = 3x + (-8)$$

Therefore,

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

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

(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,

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

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

$$(vi) \ 3y = 7$$

$$3y = 7$$

$$3y = 0 \cdot x + 7$$

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

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

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,

$$y = mx + c$$

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

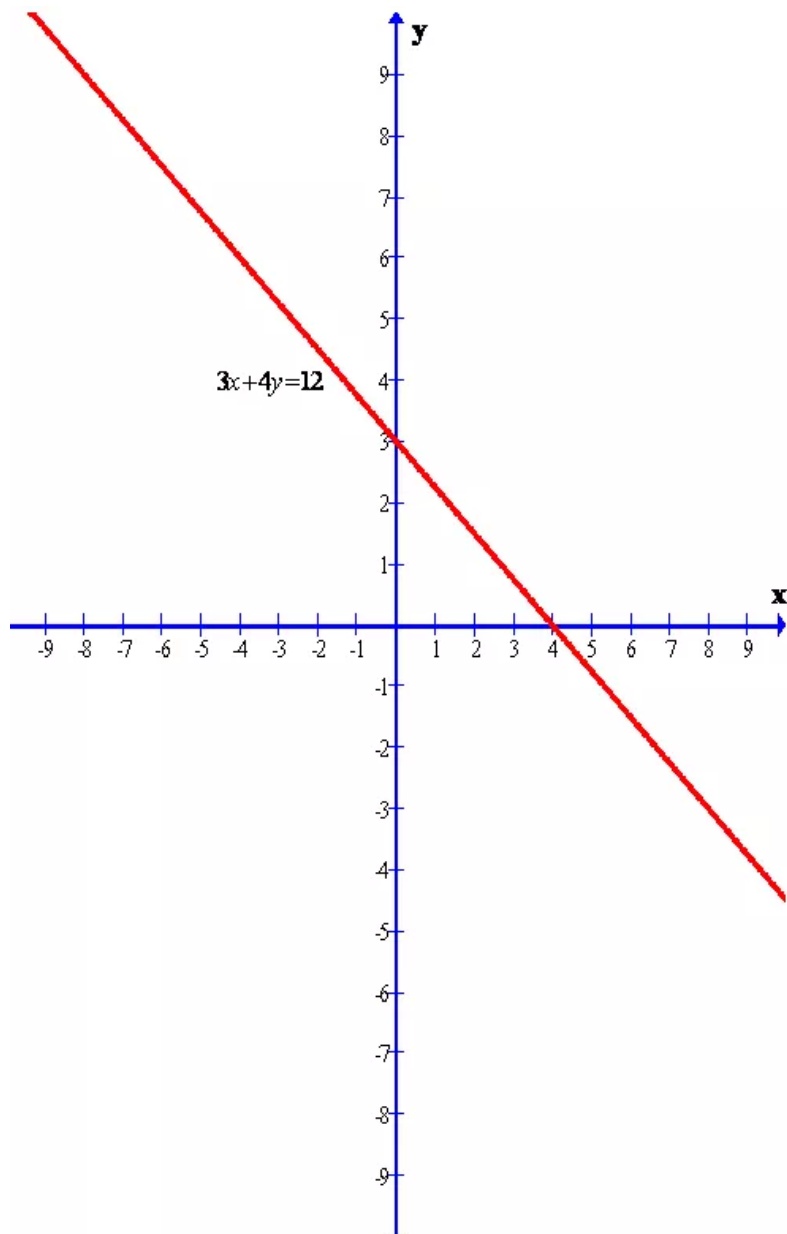
$$y = 0$$

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.

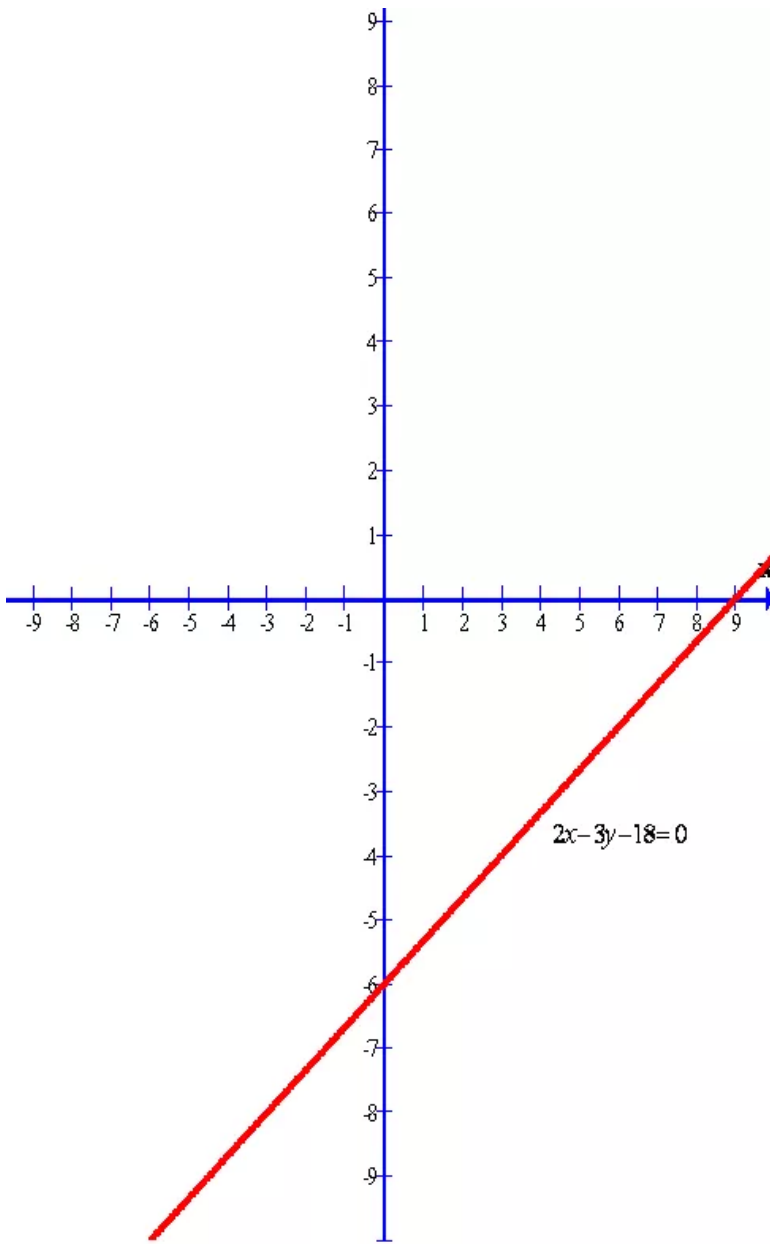
Solution 9:

Given line is

$$2x - 3y - 18 = 0$$

The graph of the given line is shown below.





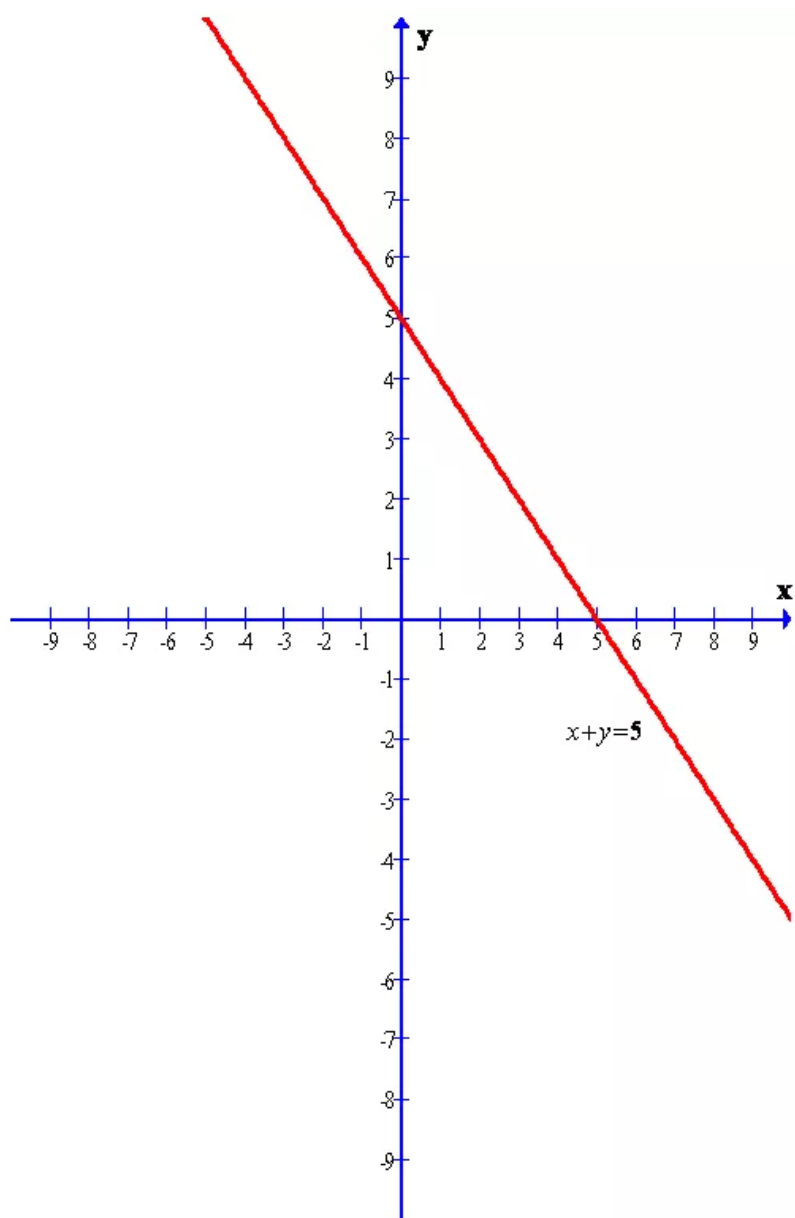
Clearly from the graph we can find the y-intercept.
The required y-intercept is -6

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

$$x + y = 5$$

$$y = -x + 5$$

$$y = (-1) \cdot x + 5 \dots\dots (A)$$

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 $\tan \theta$ then inclination of the line is θ

Now from the equation (A), we have

$$m = -1$$

$$\tan \theta = -1$$

$$\tan \theta = \tan 135^\circ$$

$$\theta = 135^\circ$$

And $c = 5$

Therefore the required inclination is $\theta = 135^\circ$ and y-intercept is $c = 5$