Linear Equations in Two Variables Ex 13.3 Q17

Answer :

We are given,

$2x+3y=12$

We get,

$y=\frac{12-2x}{3}$

Now, substituting $x=0$ in $y=\frac{12-2x}{3}$, we get

$y=4$

Substituting $x=6$ in $y=\frac{12-2x}{3}$, we get

$y=0$

Thus, we have the following table exhibiting the abscissa and ordinates of points on the line represented by the given equation

x	0	6
y	4	0

Plotting A(0,4) and E(6,0) on the graph and by joining the points , we obtain the graph of equation $2x+3y=12$.

We are given,

$x-y=1$

We get,

$y=x-1$

Now, substituting $x=0$ in $y=x-1$,we get

$y=-1$

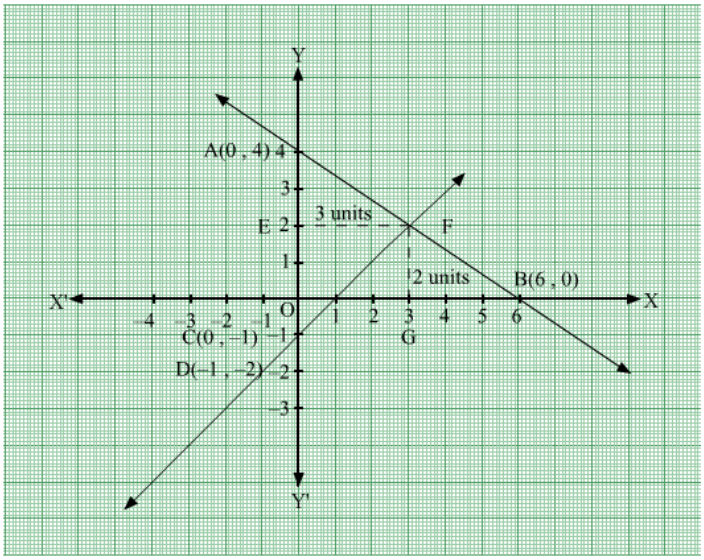
Substituting $x=-1$ in $y=x-1$,we get

$y=-2$

Thus, we have the following table exhibiting the abscissa and ordinates of points on the line represented by the given equation

x	0	-1
y	-1	-2

Plotting D(0,1) and E(-1,0) on the graph and by joining the points , we obtain the graph of equation $x-y=1$.



By the intersection of lines formed by $2x+3y=12$ and $x-y=1$ on the graph, triangle ABC is formed on y axis.

AC at *y* axis is the base of triangle ABC having AC = 5 units on *y* axis.

Draw FE perpendicular from F on *y* axis.

FE parallel to *x* axis is the height of triangle ABC having FE = 3 units on *x* axis.

Therefore,

Area of triangle ABC, say *A* is given by

$$\begin{aligned} \boldsymbol{A} &= \tfrac{1}{2}\,(\mathbf{Base} \times \mathbf{Height}) \\ &= \tfrac{1}{2}\,(\mathbf{AC} \times \mathbf{FE}) \\ &= \tfrac{1}{2}\,(5 \times 3) \\ &= \tfrac{15}{2}\ \mathbf{sq.\ units} \end{aligned}$$

********** END **********