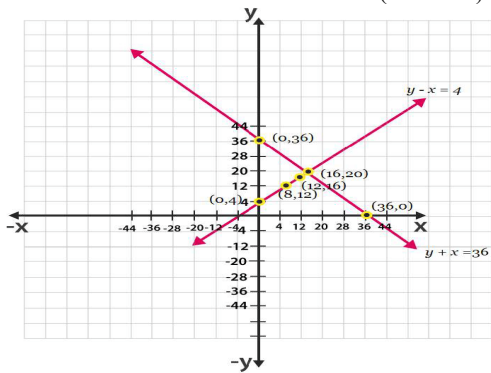


Mathematics

Chapter 3 –Pair of Linear Equations in Two Variables

Exercise 3.1

(...Contd)



From the graph you can see, the lines intersect each other at a point (16, 20). Hence, the width of the garden is 16 and length is 20

6. Given the linear equation $2x + 3y - 8 = 0$, write another linear equation in two variables such that the geometrical representation of the pair so formed is:

- (i) Intersecting lines
- (ii) Parallel lines
- (iii) Coincident lines

Soln:(i) Given the linear equation $2x + 3y - 8 = 0$.
To find another linear equation in two variables such that the geometrical representation of the pair so formed is intersecting lines, it should satisfy below condition; $(a_1/a_2) \neq (b_1/b_2)$

Thus, another equation could be $2x - 7y + 9 = 0$, such that; $(a_1/a_2) = 2/2 = 1$ and $(b_1/b_2) = 3/-7$
Clearly, you can see another equation satisfies the condition.

(ii) Given the linear equation $2x + 3y - 8 = 0$.
To find another linear equation in two variables such that the geometrical representation of the pair so formed is parallel lines, it should satisfy below condition;

$$(a_1/a_2) = (b_1/b_2) \neq (c_1/c_2)$$

Thus, another equation could be $6x + 9y + 9 = 0$, such that; $(a_1/a_2) = 2/6 = 1/3$

$$(b_1/b_2) = 3/9 = 1/3$$

$$(c_1/c_2) = -8/9$$

Clearly, you can see another equation satisfies the condition.

(iii) Given the linear equation $2x + 3y - 8 = 0$.
To find another linear equation in two variables such that the geometrical representation of the pair so formed is coincident lines, it should satisfy below condition; $(a_1/a_2) = (b_1/b_2) = (c_1/c_2)$

Thus, another equation could be $4x + 6y - 16 = 0$, such that $(a_1/a_2) = 2/4 = 1/2$, $(b_1/b_2) = 3/6 = 1/2$,

$$(c_1/c_2) = -8/-16 = 1/2$$

Clearly, you can see another equation satisfies the condition.

7. Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

Soln: Given, the equations for graphs are
 $x - y + 1 = 0$ and $3x + 2y - 12 = 0$.

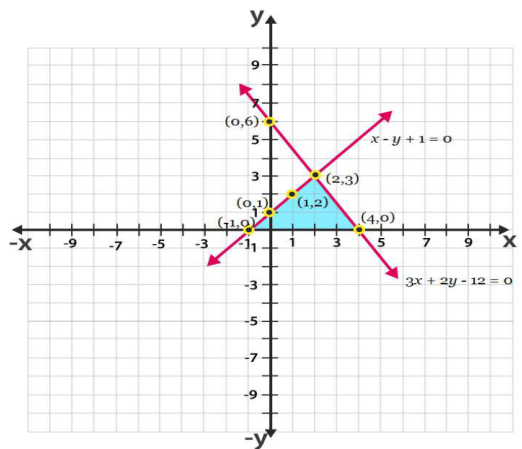
For, $x - y + 1 = 0$ or $x = -1 + y$

x	0	1	2
y	1	2	3

For, $3x + 2y - 12 = 0$ or $x = (12 - 2y)/3$

x	4	2	0
y	0	3	6

Hence, the graphical representation of these equations is as follows;



From the figure, it can be seen that these lines are intersecting each other at point (2, 3) and x-axis at (-1, 0) and (4, 0). Therefore, the vertices of the triangle are (2, 3), (-1, 0), and (4, 0).

Exercise 3.2

1. Solve the following pair of linear equations by the substitution method

(i) $x + y = 14$

(ii) $s - t = 3$

$x - y = 4$

$$\frac{s}{3} + \frac{t}{2} = 6$$

(iii) $3x - y = 3$
 $9x - 3y = 9$

(iv) $0.2x + 0.3y = 1.3$
 $0.4x + 0.5y = 2.3$

(v) $\sqrt{2}x + \sqrt{3}y = 0$

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

$\sqrt{3}x - \sqrt{8}y = 0$

$$\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$$

Soln:(i) Given,
 $x + y = 14$ and $x - y = 4$ are the two equations.

From 1st equation, we get,

$$x = 14 - y$$

Now, substitute the value of x in second equation to get,

$$(14 - y) - y = 4$$

$$14 - 2y = 4$$

$$2y = 10 \quad \text{OR} \quad y = 5$$

(Contd.....)