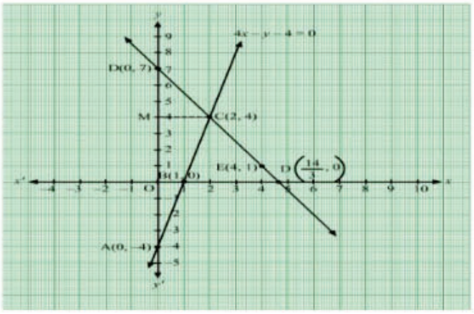


From the graph, it is clear that, the given lines intersect at (2, 4).
So, the solution of the given system of equation is (2, 4).
From the graph, the vertices of the triangle formed by the given lines and the y-axis are 0, 7), (0, -4) and (2, 4).
Now, draw a perpendicular from the intersection point C on the y-axis. So,

Area (ΔDAB) = $\frac{1}{2} \times DA \times CM$

$= \frac{1}{2} \times 11 \times 2$

= 11 sq. units

Hence, the vertices of the triangle formed by the given lines and the y-axis are (0, 7), (0, -4) and (2, 4) and the area of the triangle is 11 sq. units.

18. Solve graphically the system of equations
$x - y - 5 = 0$
$3x + 5y - 15 = 0$.
Find the coordinates of the vertices of the triangle formed by these two lines and the y-axis.
Sol:
From the first equation, write y in terms of x
$y = x - 5$ …….(i)
Substitute different values of x in (i) to get different values of y
For $x = 0$, $y = 0 - 5 = -5$
For $x = 2$, $y = 2 - 5 = -3$
For $x = 5$, $y = 5 - 5 = 0$
Thus, the table for the first equation ($x - y - 5 = 0$) is

x	0	2	5
y	-5	-3	0

Now, plot the points A(0, -5), B(2, -3) and C(5, 0) on a graph paper and join A, B and C to get the graph of $x - y - 5 = 0$.
From the second equation, write y in terms of x
$y = \frac{15-3x}{5}$ …….(ii)
Now, substitute different values of x in (ii) to get different values of y

For x = -5, y = $\frac{15 + 15}{5}$ = 6

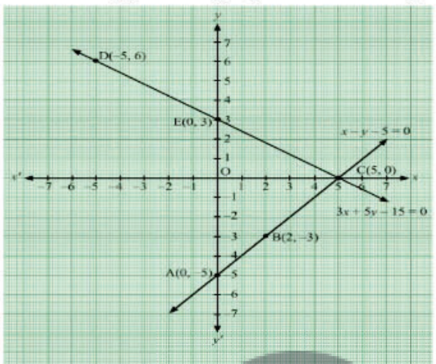
For x = 0, y = $\frac{15 - 0}{5}$ = 3

For x = 5, y = $\frac{15-15}{5}$ = 0

So, the table for the second equation (3x + 5y - 15 = 0) is

x	-5	0	5
y	6	3	0

Now, plot the points D(-5, 6), E(0, 3) and F(5, 0) on the same graph paper and join D, E and F to get the graph of 3x + 5y - 15 = 0.



From the graph, it is clear that, the given lines intersect at (5, 0).

So, the solution of the given system of equation is (5, 0).

From the graph, the vertices of the triangle formed by the given lines and the y-axis are 0, 3), (0, -5) and (5, 0).

Now, draw a perpendicular from the intersection point C on the y-axis. So,

Area (ΔCEA) = $\frac{1}{2} \times$ EA $\times$ OC

= $\frac{1}{2} \times 8 \times 5$

= 20 sq. units

Hence, the vertices of the triangle formed by the given lines and the y-axis are (0, 3), (0, -5) and (5, 0) and the area of the triangle is 20 sq. units.

19. Solve graphically the system of equations

2x – 5y + 4 = 0

2x + y - 8 = 0.

Find the coordinates of the vertices of the triangle formed by these two lines and the y-axis.

Sol:

From the first equation, write y in terms of x

y = $\frac{2x + 4}{5}$ …….(i)

Substitute different values of x in (i) to get different values of y

For x = -2, y = $\frac{-4 + 4}{5}$ = 0

For x = 0, y = $\frac{\mathbf{0+4}}{\mathbf{5}} = \frac{4}{5}$

For x = 3, y = $\frac{\mathbf{6+4}}{\mathbf{5}} = 2$

Thus, the table for the first equation (2x – 5y + 4 = 0) is

x	-2	0	3
y	0	$\frac{4}{5}$	2

Now, plot the points A(-2, 0), B(0, $\frac{4}{5}$) and C(3, 2) on a graph paper and join A, B and C to get the graph of 2x – 5y + 4 = 0.

From the second equation, write y in terms of x

y = 8 – 2x ……..(ii)

Now, substitute different values of x in (ii) to get different values of y

For x = 0, y = 8 – 0 = 8

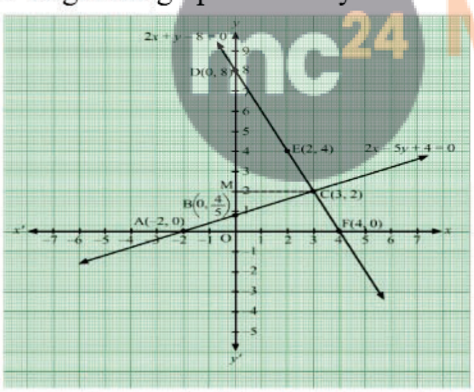
For x = 2, y = 8 – 4 = 3

For x = 4, y = 8 – 8 = 0

So, the table for the second equation (2x – 5y + 4 = 0) is

x	0	2	4
y	8	4	0

Now, plot the points D(0, 8), E(2, 4) and F(4, 0) on the same graph paper and join D, E and F to get the graph of 2x + y - 8 = 0.



From the graph, it is clear that, the given lines intersect at (3, 2).

So, the solution of the given system of equation is (3, 2).

The vertices of the triangle formed by the system of equations and y-axis are (0, 8), (0, $\frac{4}{5}$) and (3, 2).

Draw a perpendicular from point C on the y-axis. So,

Area (ΔDBC) = $\frac{\mathbf{1}}{\mathbf{2}} \times$ DB $\times$ CM

$= \frac{1}{2} \times \left(\mathbf{8} - \frac{4}{5}\right) \times 3$

$= \frac{\mathbf{54}}{\mathbf{5}}$ sq. units

Hence, the vertices of the triangle are (0, 8), (0, $\frac{4}{5}$) and (3, 2) and its area is $\frac{\mathbf{54}}{\mathbf{5}}$ sq. units.

20. Solve graphically the system of equations
5x - y = 7
x - y + 1 = 0.
Find the coordinates of the vertices of the triangle formed by these two lines and the y-axis.
Sol:
On a graph paper, draw a horizontal line X'OX and a vertical line YOY' as the x-axis and y-axis, respectively.

Graph of 5x - y = 7

5x - y = 7
⇒y = (5x – 7) …(i)
Putting x = 0, we get y = -7.
Putting x = 1, we get y = -2.
Putting x = 2, we get y = 3.
Thus, we have the following table for the equation 5x - y = 7.

x	0	1	2
y	-7	-2	3

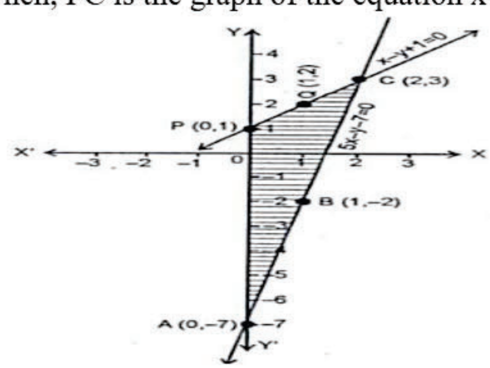
Now, plot the points A(0, -7), B(1, -2) and C(2, 3) on the graph paper.
Join AB and BC to get the graph line AC. Extend it on both ways.
Thus, AC is the graph of 5x - y = 7.

Graph of x - y + 1 = 0

x - y + 1 = 0
⇒ y = x + 1 ……..(ii)
Putting x = 0, we get y = 1.
Putting x = 1, we get y = 2.
Putting x = 2, we get y = 3.
Thus, we have the following table for the equation x - y + 1 = 0.

x	0	1	2
y	1	2	3

Now, plot the points P(0, 1) and Q(1, 2). The point C(2, 3) has already been plotted. Join PQ and QC to get the graph line PC. Extend it on both ways.
Then, PC is the graph of the equation x - y + 1 = 0.



The two graph lines intersect at C(2, 3).

∴ The solution of the given system of equations is x = 2 and y = 3.
Clearly, the vertices of ΔAPC formed by these two lines and the y-axis are P(0, 1), C(2, 3) and A(0, -7).
Now, consider ΔAPC.
Here, height = 2 units and base (AP) = 8 units
∴ Area ΔAPC = $\frac{1}{2} \times$ base $\times$ height sq. units
$= \frac{1}{2} \times 8 \times 2$
= 8 sq. units.

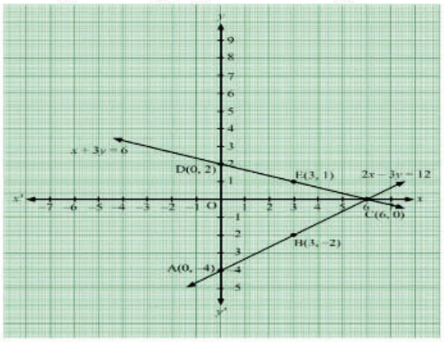
21. Solve graphically the system of equations
2x – 3y = 12
x + 3y = 6.
Find the coordinates of the vertices of the triangle formed by these two lines and the y-axis.
Sol:
From the first equation, write y in terms of x
$y = \frac{2x - 12}{3}$ …….(i)
Substitute different values of x in (i) to get different values of y
For x = 0, $y = \frac{0-12}{3} = -4$
For x = 3, $y = \frac{6 - 12}{3} = -2$
For x = 6, $y = \frac{12-12}{3} = 0$
Thus, the table for the first equation (2x – 3y = 12) is

x	0	3	6
y	-4	-2	0

Now, plot the points A(0, -4), B(3,-2) and C(6, 0) on a graph paper and join A, B and C to get the graph of 2x – 3y = 12.
From the second equation, write y in terms of x
$y = \frac{6 - x}{3}$ …….(ii)
Now, substitute different values of x in (ii) to get different values of y
For x = 0, $y = \frac{6 - 0}{3} = 2$
For x = 3, $y = \frac{6 - 3}{3} = 1$
For x = 6, $y = \frac{6 - 6}{3} = 0$
So, the table for the second equation (x + 3y = 6) is

x	0	3	6
y	2	1	0

Now, plot the points D(0, 2), E(3, 1) and F(6, 0) on the same graph paper and join D, E and F to get the graph of x + 3y = 6.



From the graph, it is clear that, the given lines intersect at (6, 0).
So, the solution of the given system of equation is (6, 0).
The vertices of the triangle formed by the system of equations and y-axis are (0, 2), (6, 0) and (0, -4).

Area (ΔDAC) = $\frac{1}{2} \times DA \times OC$

$= \frac{1}{2} \times 6 \times 6$

= 18 sq. units

Hence, the vertices of the triangle are (0, 2), (6, 0) and (0, -4) and its area is 18 sq. units.

22. Show graphically that the system of equations 2x + 3y = 6, 4x + 6y = 12 has infinitely many solutions.

Sol:

From the first equation, write y in terms of x

$y = \frac{6 - 2x}{3}$ …….(i)

Substitute different values of x in (i) to get different values of y

For x = -3, $y = \frac{6 + 6}{3} = 4$

For x = 3, $y = \frac{6 - 6}{3} = 0$

For x = 6, $y = \frac{6 - 12}{3} = -2$

Thus, the table for the first equation (2x + 3y = 6) is

x	-3	3	6
y	4	0	-2

Now, plot the points A(-3, 4), B(3, 0) and C(6, -2) on a graph paper and join A, B and C to get the graph of 2x + 3y = 6.

From the second equation, write y in terms of x

$y = \frac{12 - 4x}{6}$ …….(ii)

Now, substitute different values of x in (ii) to get different values of y

For x = -6, $y = \frac{12 + 24}{6} = 6$

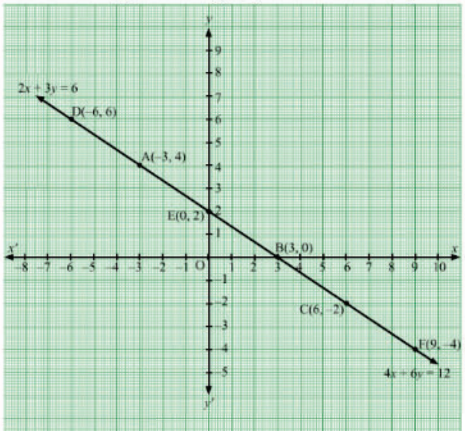
For x = 0, y = $\frac{12 - 0}{6}$ = 2

For x = 9, y = $\frac{12 - 36}{6}$ = -4

So, the table for the second equation (4x + 6y = 12) is

x	-6	0	9
y	6	2	-4

Now, plot the points D(-6, 6), E(0, 2) and F(9, -4) on the same graph paper and join D, E and F to get the graph of 4x + 6y = 12.



From the graph, it is clear that, the given lines coincidence with each other.
Hence, the solution of the given system of equations has infinitely many solutions.

23. Show graphically that the system of equations 3x - y = 5, 6x - 2y = 10 has infinitely many solutions.

Sol:

On a graph paper, draw a horizontal line X'OX and a vertical line YOY' representing the x-axis and y-axis, respectively.

Graph of 3x - y = 5

3x - y = 5

⇒y = 3x - 5 …(i)

Putting x = 1, we get y = -2

Putting x = 0, we get y = -5

Putting x = 2, we get y = 1

Thus, we have the following table for the equation 3x - y = 5

x	1	0	2
y	-2	-5	1

Now, plot the points A(1, -2), B(0, -5) and C(2, 1) on the graph paper.

Join AB and AC to get the graph line BC. Extend it on both ways.

Thus, the line BC is the graph of 3x - y = 5.

Graph of 6x - 2y = 10

6x - 2y = 10

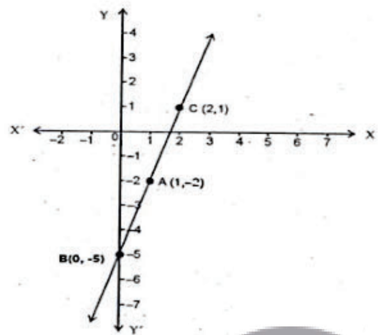
⇒ 2y = (6x – 10)

⇒ y = $\frac{6x-10}{2}$ …(ii)

Putting x = 0, we get y = -5
Putting x = 1, we get y = -2
Putting x = 2, we get y = 1
Thus, we have the following table for the equation 6x - 2y = 10.

x	0	1	2
y	-5	-2	1

These are the same points as obtained for the graph line of equation (i).



It is clear from the graph that these two lines coincide.
Hence, the given system of equations has infinitely many solutions.

24. Show graphically that the system of equations 2x + y = 6, 6x + 3y = 18 has infinitely many solutions.

Sol:

On a graph paper, draw a horizontal line X'OX and a vertical line YOY' representing the x-axis and y-axis, respectively.

Graph of 2x + y = 6

2x + y = 6

⇒y = (6 – 2x) …(i)

Putting x = 3, we get y = 0
Putting x = 1, we get y = 4
Putting x = 2, we get y = 2
Thus, we have the following table for the equation 2x + y = 6

x	3	1	2
y	0	4	2

Now, plot the points A(3, 0), B(1, 4) and C(2, 2) on the graph paper.
Join AC and CB to get the graph line AB. Extend it on both ways.
Thus, the line AB is the graph of 2x + y = 6.

Graph of 6x + 3y = 18

6x + 3y = 18

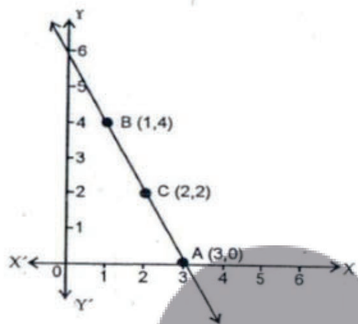
⇒ 3y = (18 - 6x)

⇒ y = $\frac{18 - 6x}{3}$ …(ii)

Putting x = 3, we get y = 0
Putting x = 1, we get y = 4
Putting x = 2, we get y = 2
Thus, we have the following table for the equation 6x + 3y = 18.

x	3	1	2
y	0	4	2

These are the same points as obtained for the graph line of equation (i).



It is clear from the graph that these two lines coincide.
Hence, the given system of equations has an infinite number of solutions.

25. Show graphically that the system of equations x - 2y = 5, 3x - 6y = 15 has infinitely many solutions.

Sol:

From the first equation, write y in terms of x

y = $\frac{x - 5}{2}$ …….(i)

Substitute different values of x in (i) to get different values of y

For x = -5, y = $\frac{-5-5}{2}$ = -5

For x = 1, y = $\frac{1 - 5}{2}$= -2

For x = 3, y = $\frac{3 - 5}{2}$ = -1

Thus, the table for the first equation (x - 2y = 5) is

x	-5	1	3
y	-5	-2	-1

Now, plot the points A(-5, -5), B(1, -2) and C(3, -1) on a graph paper and join A, B and C to get the graph of x - 2y = 5.

From the second equation, write y in terms of x

y = $\frac{3x - 15}{6}$ …….(ii)

Now, substitute different values of x in (ii) to get different values of y

For x = -3, y = $\frac{-9 - 15}{6}$ = -4

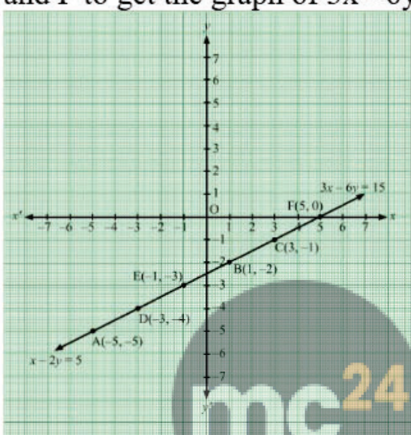
For x = -1, y = $\frac{-3 - 15}{6}$ = -3

For x = 5, y = $\frac{15 - 15}{6}$ = 0

So, the table for the second equation (3x - 6y = 15) is

x	-3	-1	5
y	-4	-3	0

Now, plot the points D(-3, -4), E(-1, -3) and F(5, 0) on the same graph paper and join D, E and F to get the graph of 3x - 6y = 15.



From the graph, it is clear that, the given lines coincide with each other.

Hence, the solution of the given system of equations has infinitely many solutions.

26. Show graphically that the system of equations x - 2y = 6, 3x - 6y = 0 is inconsistent.

Sol:

From the first equation, write y in terms of x

y = $\frac{x - 6}{2}$ …….(i)

Substitute different values of x in (i) to get different values of y

For x = -2, y = $\frac{-2-6}{2}$ = -4

For x = 0, y = $\frac{0 - 6}{2}$ = -3

For x = 2, y = $\frac{2 - 6}{2}$ = -2

Thus, the table for the first equation (x - 2y = 5) is

x	-2	0	2
y	-4	-3	-2

Now, plot the points A(-2, -4), B(0, -3) and C(2, -2) on a graph paper and join A, B and C to get the graph of x - 2y = 6.

From the second equation, write y in terms of x

$y = \frac{1}{2}x$ …….(ii)

Now, substitute different values of x in (ii) to get different values of y

For x = -4, $y = \frac{-4}{2} = -2$

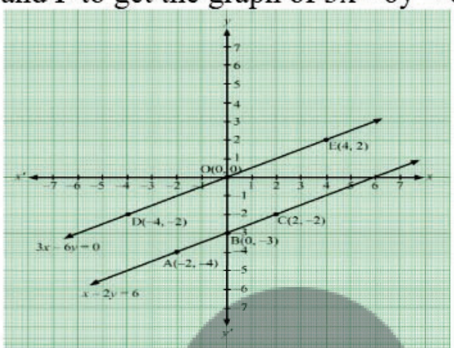
For x = 0, $y = \frac{0}{2} = 0$

For x = 4, $y = \frac{4}{2} = 2$

So, the table for the second equation (3x - 6y = 0) is

x	-4	0	4
y	-2	0	2

Now, plot the points D(-4, -2), O(0, 0) and E(4, 2) on the same graph paper and join D, E and F to get the graph of 3x - 6y = 0.



From the graph, it is clear that, the given lines do not intersect at all when produced.

Hence, the system of equations has no solution and therefore is inconsistent.

27. Show graphically that the system of equations 2x + 3y = 4, 4x + 6y = 12 is inconsistent.

Sol:

On a graph paper, draw a horizontal line X'OX and a vertical line YOY' as the x-axis and y-axis, respectively.

Graph of 2x +3y = 4

2x + 3y = 4

⇒ 3y = (–2x + 4) …(i)

Putting x = 2, we get y = 0

Putting x = -1, we get y = 2

Putting x = -4, we get y = 4

Thus, we have the following table for the equation 2x + 3y = 4.

x	2	-1	-4
y	0	2	4

Now, plot the points A(2, 0), B(-1, 2) and C(-4, 4) on the graph paper.

Join AB and BC to get the graph line AC. Extend it on both ways.

Thus, the line AC is the graph of 2x + 3y = 4.

Graph of 4x + 6y = 12

4x + 6y = 12

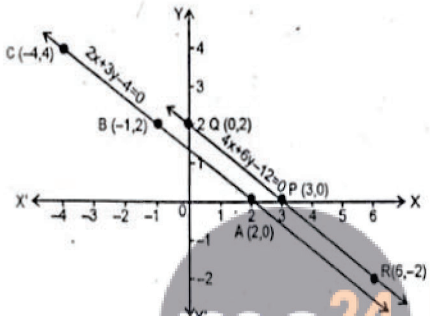
$\Rightarrow 6y = (-4x + 12)$

$\Rightarrow y = \frac{-4x+12}{6}$ …(ii)

Putting x = 3, we get y = 0
Putting x = 0, we get y = 2
Putting x = 6, we get y = -2
Thus, we have the following table for the equation 4x + 6y = 12.

x	3	0	6
y	0	2	-2

Now, on the same graph, plot the points A(3, 0), B(0, 2) and C(6, -2).
Join PQ and PR to get the graph line QR. Extend it on both ways.
Thus, QR is the graph of the equation 4x + 6y = 12.



It is clear from the graph that these two lines are parallel and do not intersect when produced.
Hence, the given system of equations is inconsistent.

28. Show graphically that the system of equations 2x + y = 6, 6x + 3y = 20 is inconsistent.
Sol:
From the first equation, write y in terms of x
y = 6 – 2x …….(i)
Substitute different values of x in (i) to get different values of y
For x = 0, y = 6 – 0 = 6
For x = 2, y = 6 – 4 = 2
For x = 4, y = 6 – 8 = -2
Thus, the table for the first equation (2x + y = 6) is

x	0	2	4
y	6	2	-2

Now, plot the points A(0, 6), B(2, 2) and C(4, -2) on a graph paper and join A, B and C to get the graph of 2x + y = 6.
From the second equation, write y in terms of x

$y = \frac{20 - 6x}{3}$ …….(ii)

Now, substitute different values of x in (ii) to get different values of y

For x = 0, y = $\frac{20-0}{3} = \frac{20}{3}$

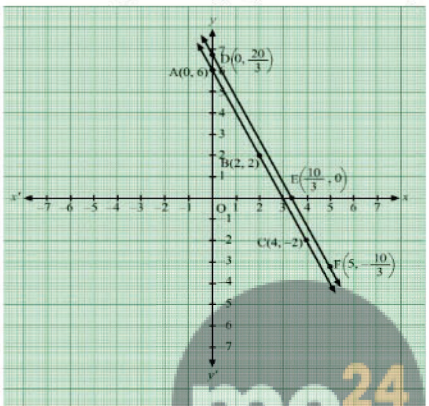
For x = $\frac{10}{3}$, y = $\frac{20-20}{3} = 0$

For x = 5, y = $\frac{20-30}{3} = -\frac{10}{3}$

So, the table for the second equation (6x + 3y = 20) is

x	0	$\frac{10}{3}$	5
y	$\frac{20}{3}$	0	$-\frac{10}{3}$

Now, plot the points D(0, $\frac{20}{3}$), O($\frac{10}{3}$, 0) and E(5, $-\frac{10}{3}$) on the same graph paper and join D, E and F to get the graph of 6x + 3y = 20.



From the graph, it is clear that, the given lines do not intersect at all when produced. Hence, the system of equations has no solution and therefore is inconsistent.

29. Draw the graphs for the following equations on the same graph paper:

2x + y = 2

2x + y = 6

Find the co-ordinates of the vertices of the trapezium formed by these lines. Also, find the area of the trapezium so formed.

Sol:

From the first equation, write y in terms of x

y = 2 – 2x ……. (i)

Substitute different values of x in (i) to get different values of y

For x = 0, y = 2 – 0 = 2

For x = 1, y = 2 – 2 = 0

For x = 2, y = 2 – 4 = -2

Thus, the table for the first equation (2x + y = 2) is

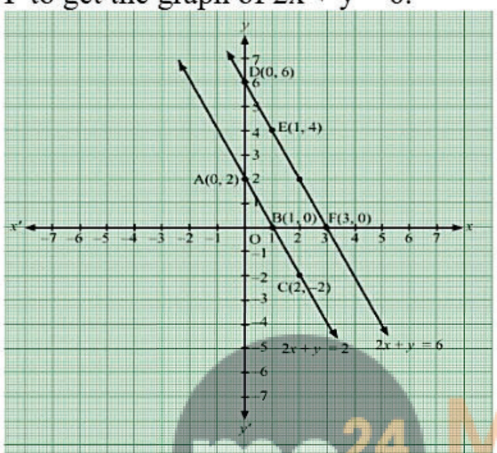
x	0	1	2
y	2	0	-2

Now, plot the points A(0, 2), B(1, 0) and C(2, -2) on a graph paper and join A, B and C to get the graph of 2x + y = 2.

From the second equation, write y in terms of x
y = 6 – 2x ……..(ii)
Now, substitute different values of x in (ii) to get different values of y
For x = 0, y = 6 – 0 = 6
For x = 1, y = 6 – 2 = 4
For x = 3, y = 6 – 6 = 0
So, the table for the second equation (2x + y = 6) is

x	0	1	3
y	6	4	0

Now, plot the points D(0,6), E(1, 4) and F(3,0) on the same graph paper and join D, E and F to get the graph of 2x + y = 6.



From the graph, it is clear that, the given lines do not intersect at all when produced. So, these lines are parallel to each other and therefore, the quadrilateral DABF is a trapezium.
The vertices of the required trapezium are D(0, 6), A (0, 2), B(1, 0) and F(3, 0).
Now,
Area(Trapezium DABF) = Area (ΔDOF) – Area(ΔAOB)

$= \frac{1}{2} \times 3 \times 6 - \frac{1}{2} \times 1 \times 2$

$= 9 – 1$

$= 8$ sq. units

Hence, the area of the required trapezium is 8 sq. units.

Exercise – 3B

1. Solve for x and y:
x + y = 3, 4x – 3y = 26
Sol:
The given system of equation is:
x + y = 3…….(i)
4x – 3y = 26 ……(ii)
On multiplying (i) by 3, we get:

$3x + 3y = 9$ ….(iii)
On adding (ii) and (iii), we get:
$7x = 35$
$\Rightarrow x = 5$
On substituting the value of x = 5 in (i), we get:
$5 + y = 3$
$\Rightarrow y = (3 – 5) = -2$
Hence, the solution is x = 5 and y = -2

2. Solve for x and y:
$x – y = 3, \frac{x}{3} + \frac{y}{2} = 6$
Sol:
The given system of equations is
$x – y = 3$ …..(i)
$\frac{x}{3} + \frac{y}{2} = 6$ ……(ii)
From (i), write y in terms of x to get
$y = x – 3$
Substituting y = x – 3 in (ii), we get
$\frac{x}{3} + \frac{x-3}{2} = 6$
$\Rightarrow 2x + 3(x – 3) = 36$
$\Rightarrow 2x + 3x – 9 = 36$
$\Rightarrow x = \frac{45}{5} = 9$
Now, substituting x = 9 in (i), we have
$9 – y = 3$
$\Rightarrow y = 9 – 3 = 6$
Hence, x = 9 and y = 6.

3. Solve for x and y:
$2x + 3y = 0, 3x + 4y = 5$
Sol:
The given system of equation is:
$2x + 3y = 0$ ……(i)
$3x + 4y = 5$ ……(ii)
On multiplying (i) by 4 and (ii) by 3, we get:
$8x + 12y = 0$ ……(iii)
$9x + 12y = 15$ …….(iv)
On subtracting (iii) from (iv) we get:

x = 15
On substituting the value of x = 15 in (i), we get:
30 + 3y = 0
$\Rightarrow$3y = -30
$\Rightarrow$y = -10
Hence, the solution is x = 15 and y = -10.

4. Solve for x and y:
2x - 3y = 13, 7x - 2y = 20
Sol:
The given system of equation is:
2x - 3y = 13 ……(i)
7x - 2y = 20 ……(ii)
On multiplying (i) by 2 and (ii) by 3, we get:
4x - 6y = 26 ……(iii)
21x - 6y = 60 …….(iv)
On subtracting (iii) from (iv) we get:
17x = (60 – 26) = 34
$\Rightarrow$x = 2
On substituting the value of x = 2 in (i), we get:
4 – 3y = 13
$\Rightarrow$3y = (4 – 13) = -9
$\Rightarrow$y = -3
Hence, the solution is x = 2 and y = -3.

5. Solve for x and y:
3x - 5y - 19 = 0, -7x + 3y + 1 = 0
Sol:
The given system of equation is:
3x - 5y - 19 = 0 ……(i)
-7x + 3y + 1 = 0 ……(ii)
On multiplying (i) by 3 and (ii) by 5, we get:
9x - 15y = 57 ……(iii)
-35x + 15y = -5 …….(iv)
On subtracting (iii) from (iv) we get:
-26x = (57 – 5) = 52
$\Rightarrow$x = -2
On substituting the value of x = -2 in (i), we get:

$-6 - 5y - 19 = 0$

$\Rightarrow 5y = (-6 - 19) = -25$

$\Rightarrow y = -5$

Hence, the solution is x = -2 and y = -5.

6. Solve for x and y:
$2x - y + 3 = 0,\ 3x - 7y + 10 = 0$
Sol:
The given system of equation is:
$2x - y + 3 = 0$.......(i)
$3x - 7y + 10 = 0$ ......(ii)
From (i), write y in terms of x to get
$y = 2x + 3$
Substituting $y = 2x + 3$ in (ii), we get
$3x - 7(2x + 3) + 10 = 0$
$\Rightarrow 3x - 14x - 21 + 10 = 0$
$\Rightarrow -7x = 21 - 10 = 11$
$x = -\frac{11}{7}$
Now substituting $x = -\frac{11}{7}$ in (i), we have
$-\frac{22}{7} - y + 3 = 0$
$y = 3 - \frac{22}{7} = -\frac{1}{7}$
Hence, $x = -\frac{11}{7}$ and $y = -\frac{1}{7}$.

7. Solve for x and y:
$9x - 2y = 108,\ 3x + 7y = 105$
Sol:
The given system of equation can be written as:
$9x - 2y = 108$ ......(i)
$3x + 7y = 105$ ......(ii)
On multiplying (i) by 7 and (ii) by 2, we get:

$63x + 6x = 108 \times 7 + 105 \times 2$

$\Rightarrow 69x = 966$

$\Rightarrow x = \frac{966}{69} = 14$

Now, substituting x = 14 in (i), we get:

$9 \times 14 - 2y = 108$

$\Rightarrow 2y = 126 - 108$

$\Rightarrow y = \frac{18}{2} = 9$

Hence, x = 14 and y = 9.

8. Solve for x and y:

$\frac{x}{3} + \frac{y}{4} = 11, \frac{5x}{6} - \frac{y}{3} + 7 = 0$

Sol:

The given equations are:

$\frac{x}{3} + \frac{y}{4} = 11$

$\Rightarrow 4x + 3y = 132$ …….(i)

and $\frac{5x}{6} - \frac{y}{3} + 7 = 0$

$\Rightarrow 5x – 2y = -42$ ……..(ii)

On multiplying (i) by 2 and (ii) by 3, we get:

$8x + 6y = 264$ …...(iii)

$15x – 6y = -126$ ….(iv)

On adding (iii) and (iv), we get:

$23x = 138$

$\Rightarrow x = 6$

On substituting x = 6 in (i), we get:

$24 + 3y = 132$

$\Rightarrow 3y = (132 – 24) = 108$

$\Rightarrow y = 36$

Hence, the solution is x = 6 and y = 36.

9. Solve for x and y:

$4x - 3y = 8, 6x - y = \frac{29}{3}$

Sol:

The given system of equation is:

$4x - 3y = 8$ ……(i)

$6x - y = \frac{29}{3}$ ……(ii)

On multiplying (ii) by 3, we get:

$18x – 3y = 29$ ….(iii)

On subtracting (iii) from (i) we get:

$-14x = -21$

$x = \frac{21}{14} = \frac{3}{2}$

Now, substituting the value of $x = \frac{3}{2}$ in (i), we get:

$4 \times \frac{3}{2} - 3y = 8$

$\Rightarrow 6 - 3y = 8$

$\Rightarrow 3y = 6 - 8 = -2$

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

Hence, the solution $x = \frac{3}{2}$ and $y = \frac{-2}{3}$.

10. Solve for x and y:

$2x - \frac{3y}{4} = 3$, $5x = 2y + 7$

Sol:

The given equations are:

$2x - \frac{3y}{4} = 3$ …..(i)

$5x = 2y + 7$ ……..(ii)

On multiplying (i) by 2 and (ii) by $\frac{3}{4}$, we get:

$4x - \frac{3}{2}y = 6$ …...(iii)

$\frac{15}{4}x = \frac{3}{2}y + \frac{21}{4}$….(iv)

On subtracting (iii) and (iv), we get:

$-\frac{1}{4}x = -\frac{3}{4}$

$\Rightarrow x = 3$

On substituting x = 3 in (i), we get:

$2 \times 3 - \frac{3y}{4} = 3$

$\Rightarrow \frac{3y}{4} = (6 - 3) = 3$

$\Rightarrow y = \frac{3 \times 4}{3} = 4$

Hence, the solution is x = 3 and y = 4.

11. Solve for x and y:

$2x + 5y = \frac{8}{3}$, $3x - 2y = \frac{5}{6}$

Sol:

The given equations are:

$2x - 5y = \frac{8}{3}$ …..(i)

$3x - 2y = \frac{5}{6}$ ……..(ii)

On multiplying (i) by 2 and (ii) by 5, we get:

$4x - 10y = \frac{16}{3}$ …...(iii)

$15x - 10y = \frac{25}{6}$……(iv)

On adding (iii) and (iv), we get:

$19x = \frac{57}{6}$

$\Rightarrow x = \frac{57}{6 \times 19} = \frac{3}{6} = \frac{1}{2}$

On substituting $x = \frac{1}{2}$ in (i), we get:

$2 \times \frac{1}{2} + 5y = \frac{8}{3}$

$\Rightarrow 5y = \left(\frac{8}{3} - 1\right) = \frac{5}{3}$

$\Rightarrow y = \frac{5}{3 \times 5} = \frac{1}{3}$

Hence, the solution is $x = \frac{1}{2}$ and $y = \frac{1}{3}$.

12. Solve for x and y:

$2x + 3y + 1 = 0$

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

Sol:

The given equations are:

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

$\Rightarrow 4x + 3y = 7$ ……..(i)

and $2x + 3y + 1 = 0$

$\Rightarrow 2x + 3y = -1$ ……….(ii)

On subtracting (ii) from (i), we get:

$2x = 8$

$\Rightarrow x = 4$

On substituting x = 4 in (i), we get:

$16x + 3y = 7$

$\Rightarrow 3y = (7 - 16) = -9$

$\Rightarrow y = -3$

Hence, the solution is x = 4 and y = -3.

13. Solve for x and y:

$0.4x + 0.3y = 1.7$, $0.7x - 0.2y = 0.8$.

Sol:

The given system of equations is

$0.4x + 0.3y = 1.7$ …….(i)

$0.7x - 0.2y = 0.8$ …….(ii)