3. Graph

Let us Work Out 3.1
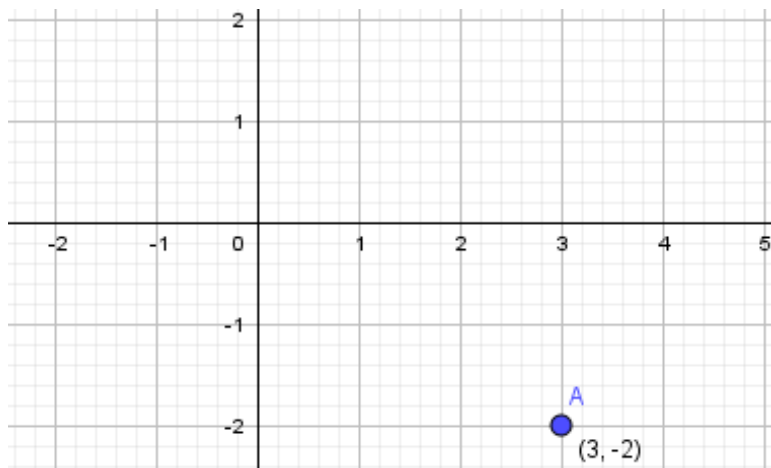
1. Question

1 plot the following points on graph paper and write the points lie above or below the x-axis.

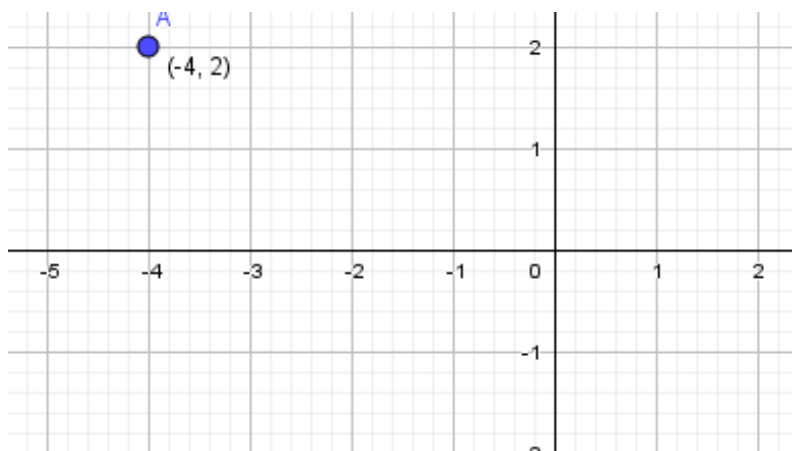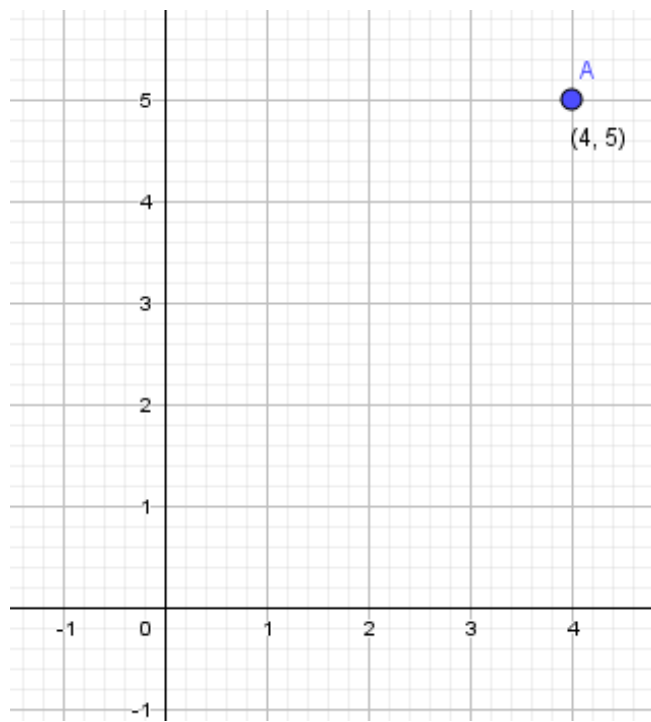(3, –2), (–4, 2), (4, 5), (–5, –5), (–2, 7), (7, –7), (0, 9), (0, –9)

Answer

(3,-2)

The point lies below the x- axis.

(-4, 2)

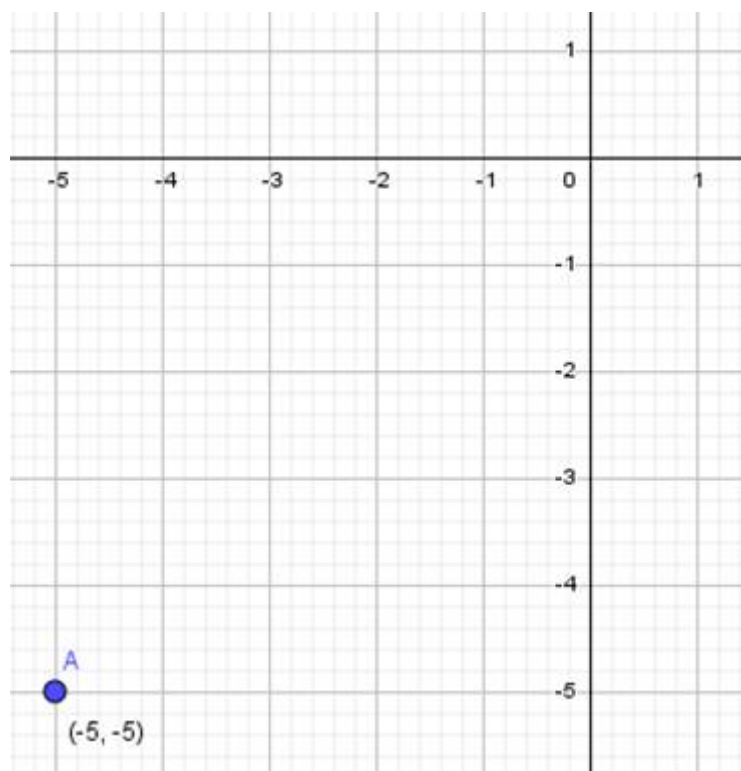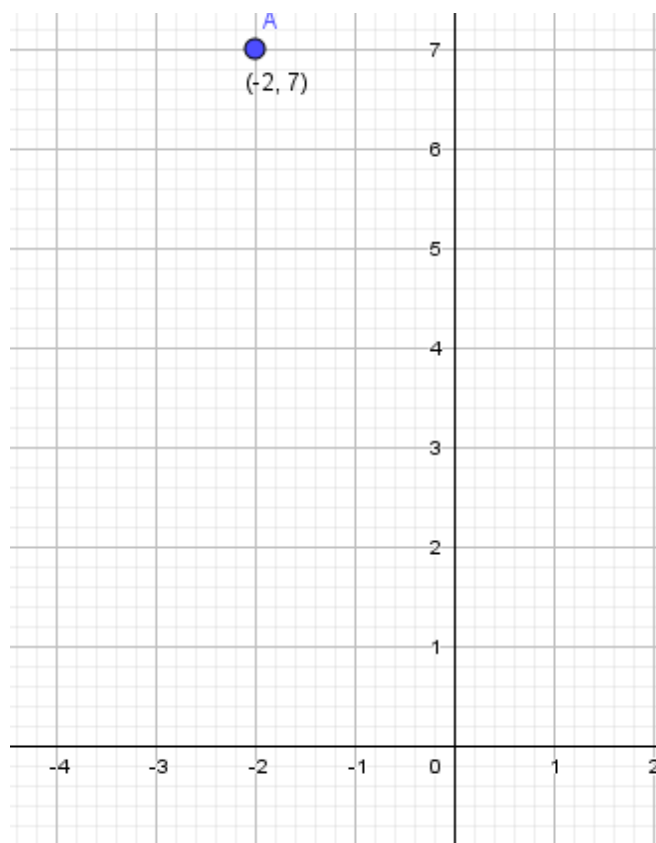

The point lies above the x-axis.
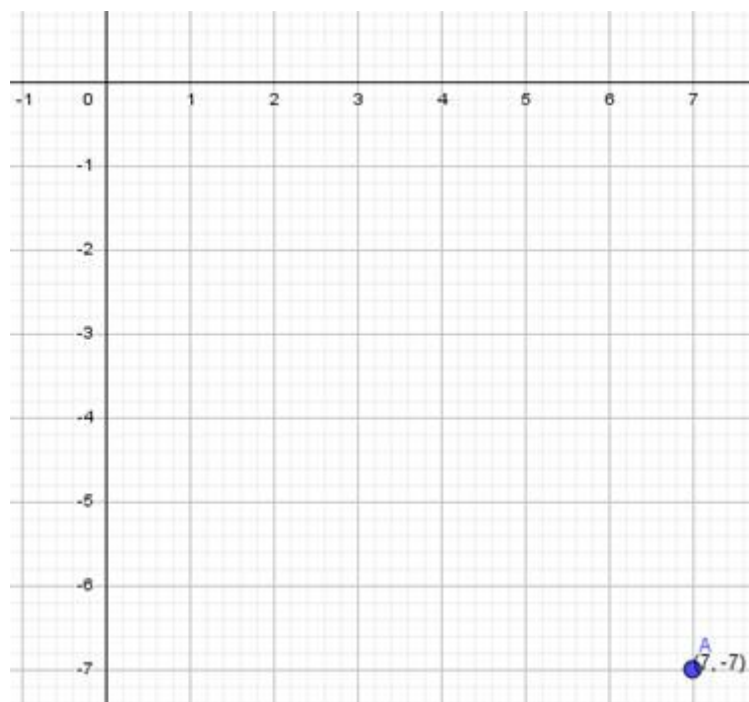
(4,5)

The point lies above the x-axis.

(-5, -5)

The point lies below the x-axis.

(-2, 7)

The point lies above the x-axis.

(7, -7)

The point lies below the x-axis.

(0, 9)
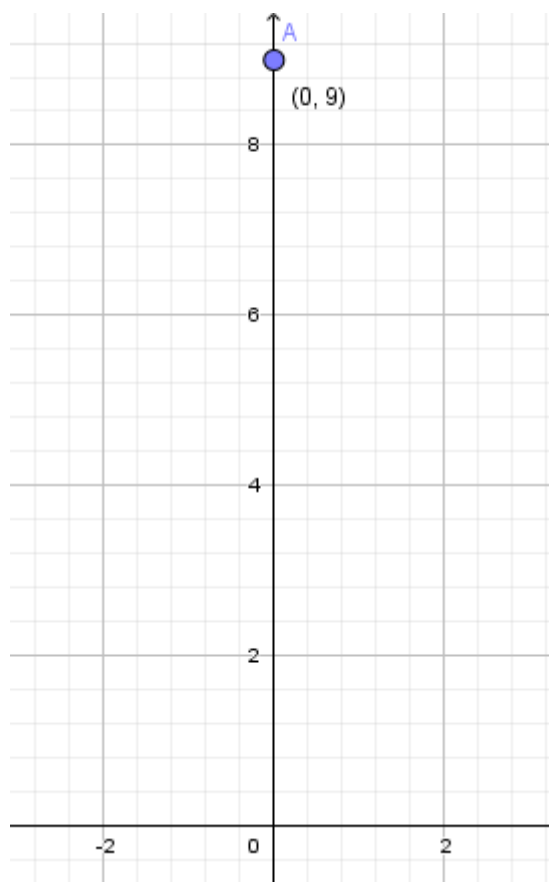
The point lies above the x-axis.

(0, -9)
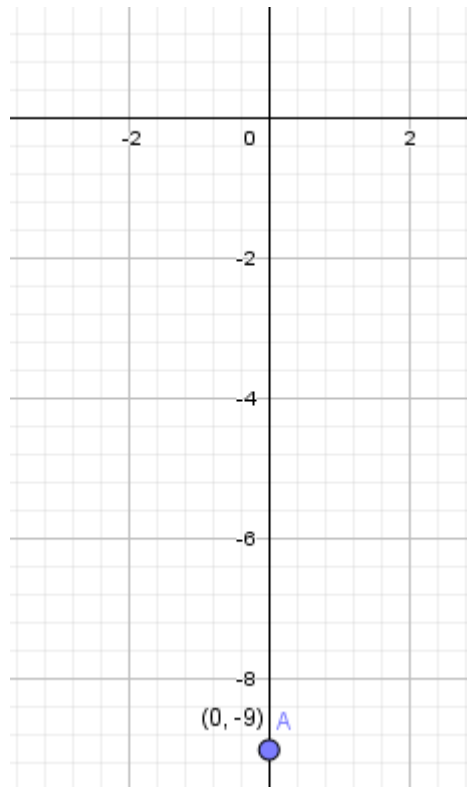
The point lies below the x-axis.

2. Question

1 plot the following points on graph paper and write the points lie on the right or left side of the y-axis.

(5, –7), (–10, 10), (–8, –4), (4, 3), (–6, 2), (11, –3), (4, 0), (–4, 0)

Answer

(5, -7)
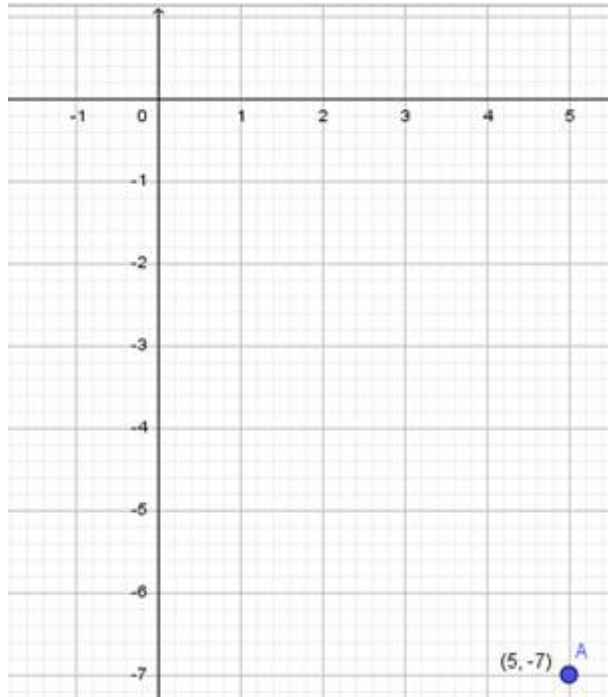
The point lies right side of y-axis.

(-10, 10)
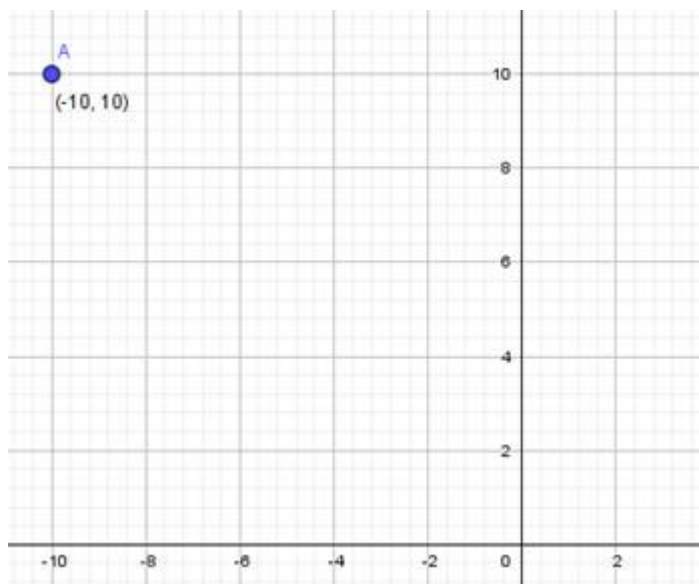
The point lies left side of y-axis.

(-8, -4)

(-8, -4)
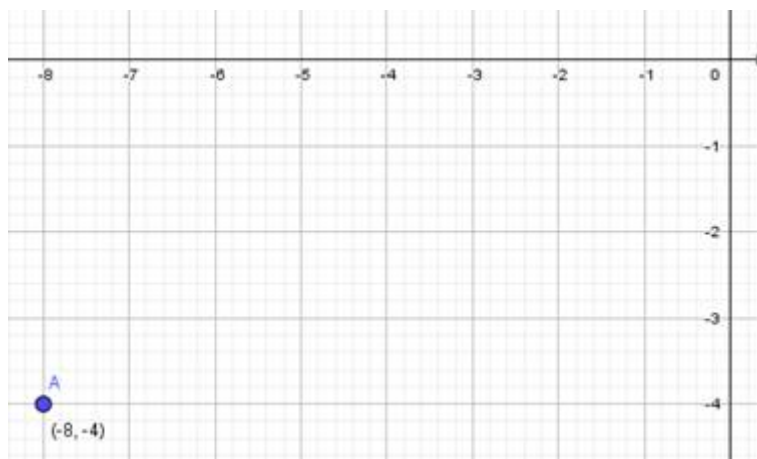
The point lies left side of y-axis.

(4, 3)
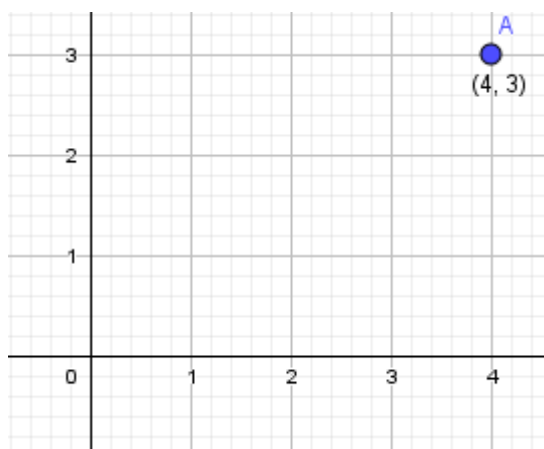
The point lies right side of y-axis.

(-6, 2)
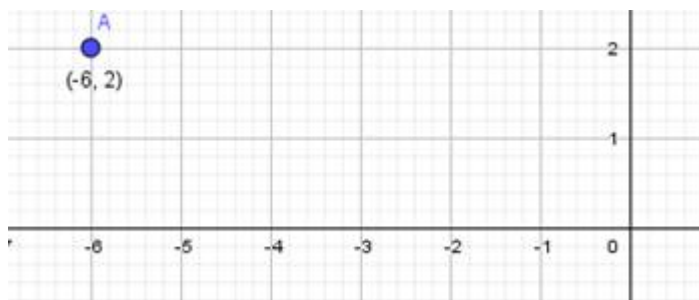
The point lies left side of y-axis.

(11, -3)
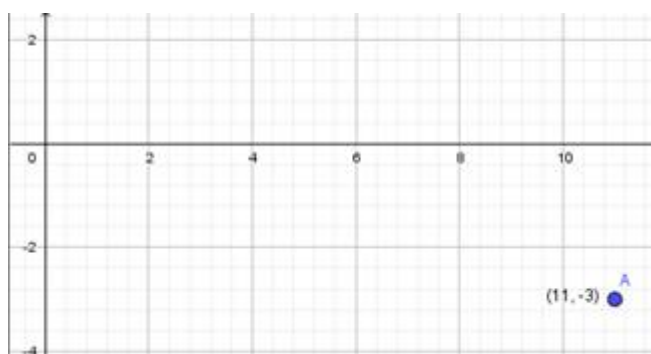
The point lies right side of y-axis.

(4, 0)
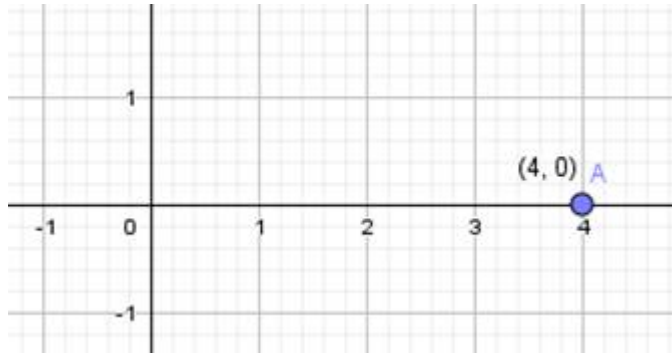
The point lies right side of y-axis.

(-4, 0)
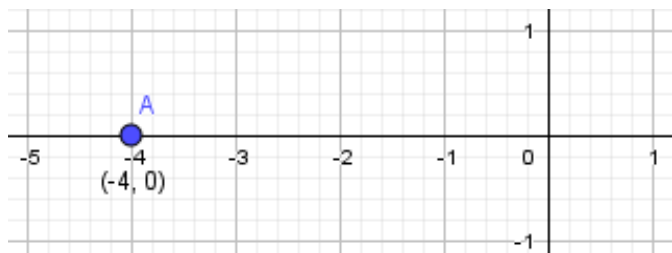
The point lies left side of y-axis.

3. Question

1 plot the following points on graph paper and write their positions (In which quadrant or on which axis and in which direction).

(−11, −7), (0, 5), (9, 0), (−4, −4), (12, −9), (3, 13), (0, −6), (−5, 0),

Answer

(-11, -7)
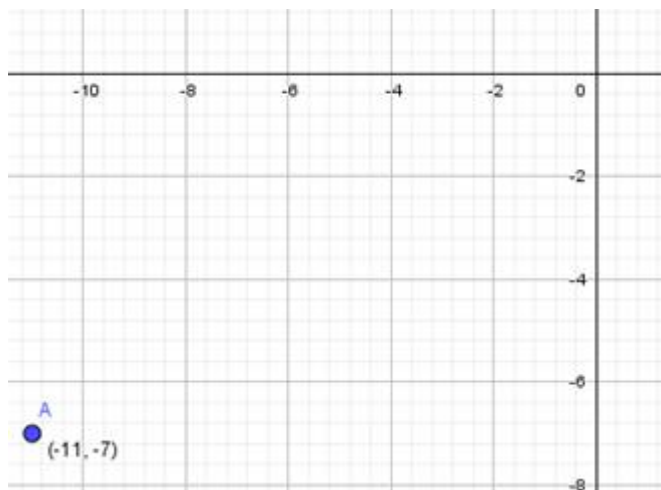
The point lies in IIIrd quadrant.

The point lie in left side of y-axis.

(0, 5)
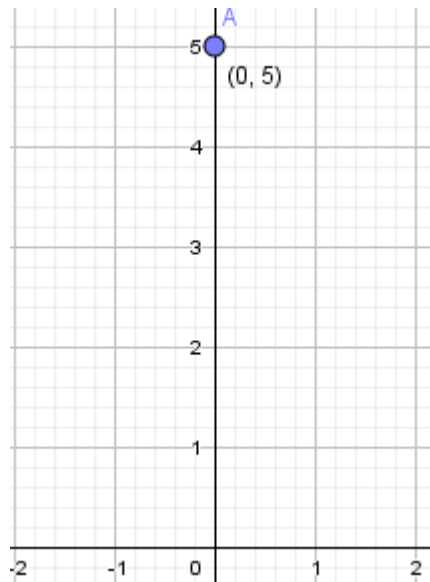
The point lies on y-axis.

The point lies above the x-axis.

(9, 0)
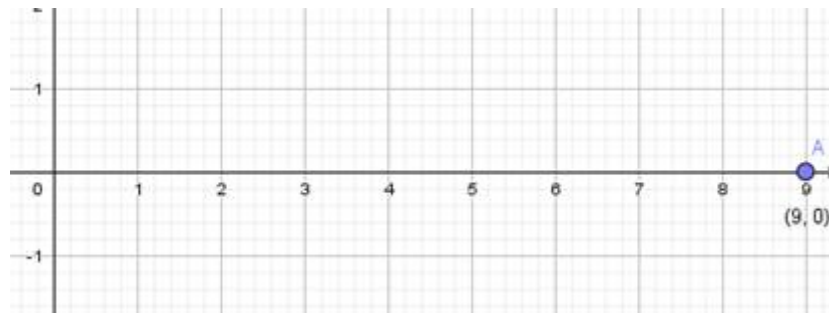
The point lies on x-axis.

The point lies right side of y-axis.

(-4, -4)
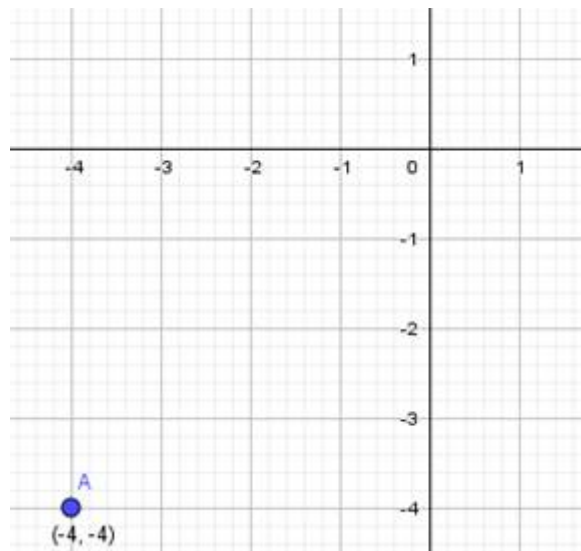
The point lies in IIIrd quadrant.

The point lies left side of y-axis.

(12, -9)
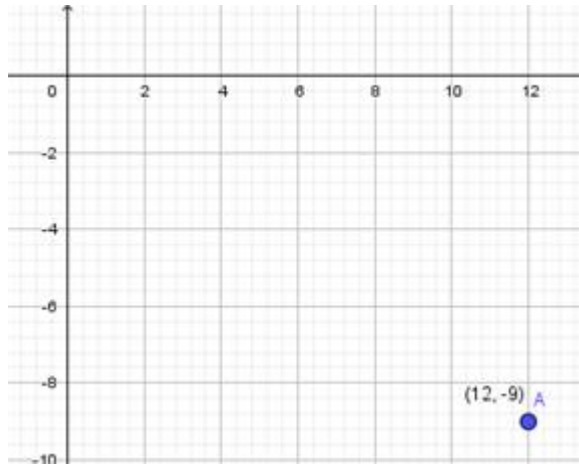
The point lie in IVth quadrant.

The point lies right side of y-axis.

(3, 13)
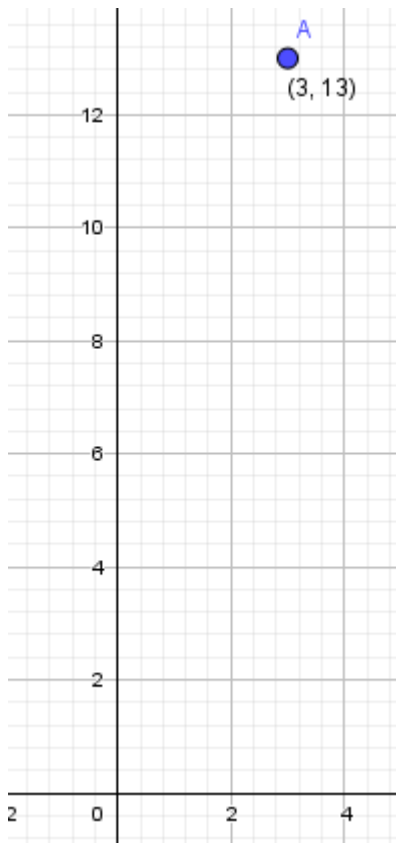
The point lies in Ist quadrant

The point lies right side of y-axis.

(0, -6)
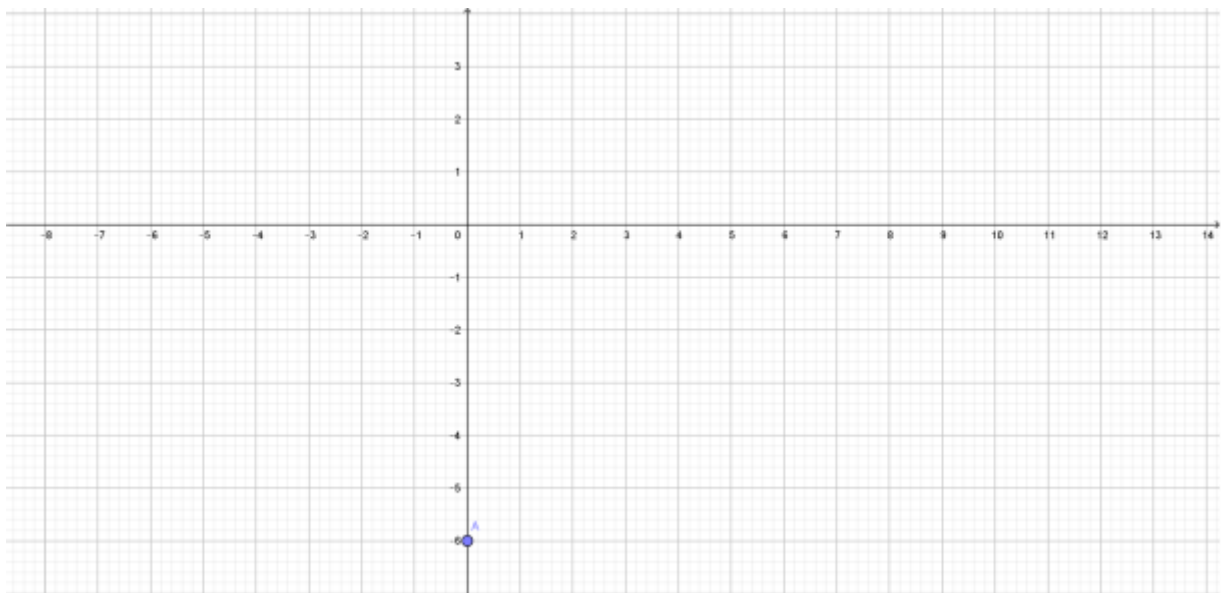
The point lies on y-axis.

The point lies below x-axis.

(-5, 0)
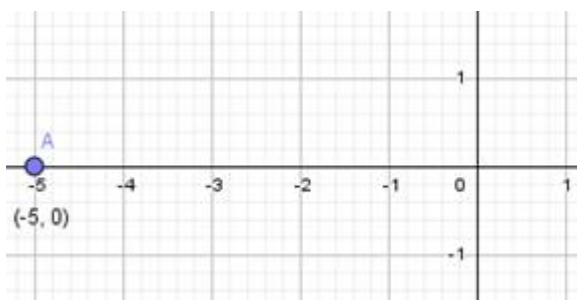
The point lies on x-axis.

The point lies left side of y-axis.

4. Question

Let us write the co-ordinates of any four points lying on x-axis.

Answer
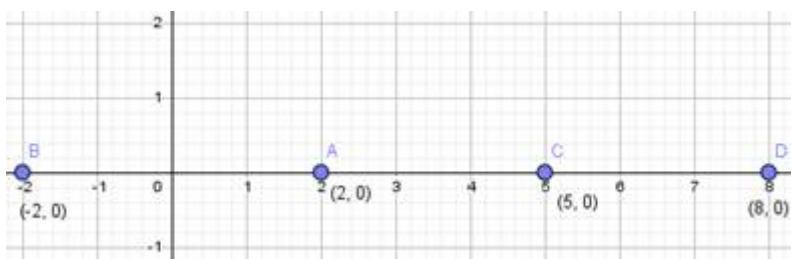
A (2, 0), B(-2, 0), C(5, 0) and D(8, 0) are 4 points lying on x-axis.

NOTE: Any point lying on x-axis has it's y-coordinate = 0.

5. Question

Let us write the co-ordinates of any four points lying on y-axis.

Answer
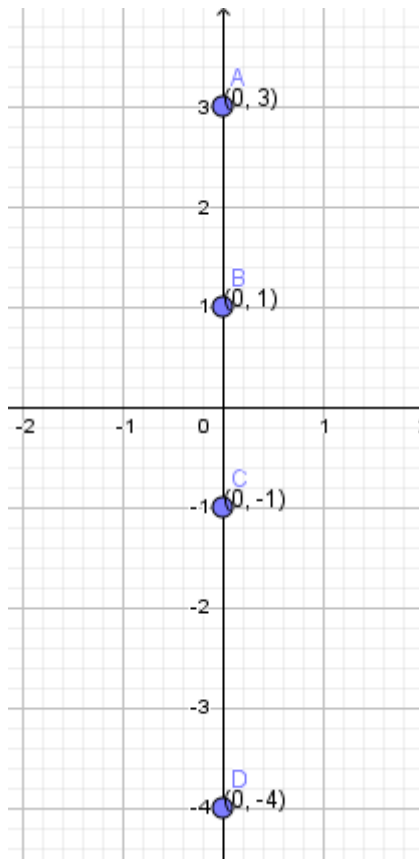
A (0, 3), B(0, 1), C(0, -1) and D(0,-4) are 4 points lying on y-axis.

NOTE: Any point lying on y-axis has it's x coordinate = 0.

6. Question

Let us write the co-ordinates of any four points lying in each quadrant.

Answer
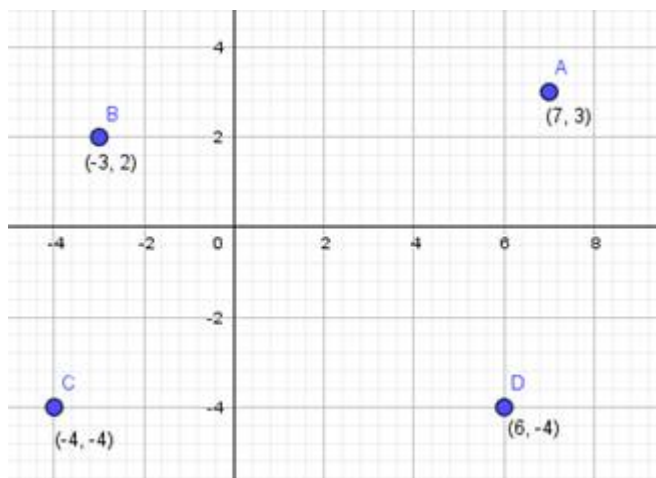
The four points lying in each quadrant are:

Ist Quadrant A(7, 3)

IInd Quadrant B(-3, 2)

IIIrd Quadrant C(-4, -4)

IVth Quadrant D(6, -4)

7. Question

The distances of a point from x-axis in positive direction is 5 units and from y-axis in positive direction is 7 units. Let us write the co-ordinates of the point.

Answer
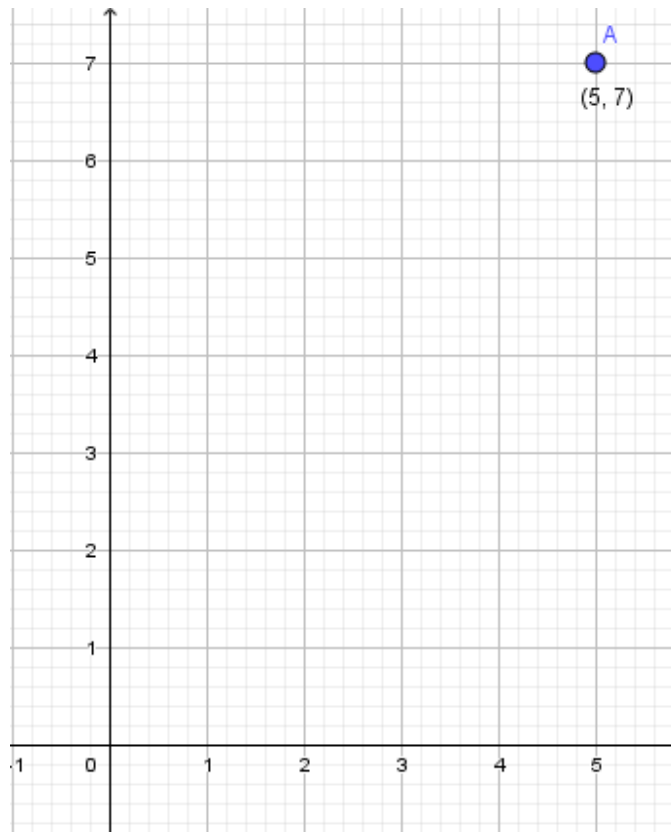
Thus, the co-ordinates of the point are: (5, 7)

Let us Work Out 3.2

1. Question

Let us plot the following points on the graph paper and write their positions (on the axes or in quadrant).

(i) (3, 0) (ii) (0, 8)

(iii) (−5, 0) (iv) (0, −6)

(v) (6, 4) (vi) (−7, 4)

(vii) (9, −9) (viii) (−4, −5)

Answer

Key Points -

- (x,y) = (abscissa, ordinate)

- Parallel lines ⇒ No Solution.

- One Intersection point ⇒ only one Solution

- Infinite Intersection point ⇒ Infinite solutions

X coordinate is called abscissa and y coordinate is called ordinate.

To plot all these points, we need to find the value of abscissa on the x axis and ordinate on y

axis.
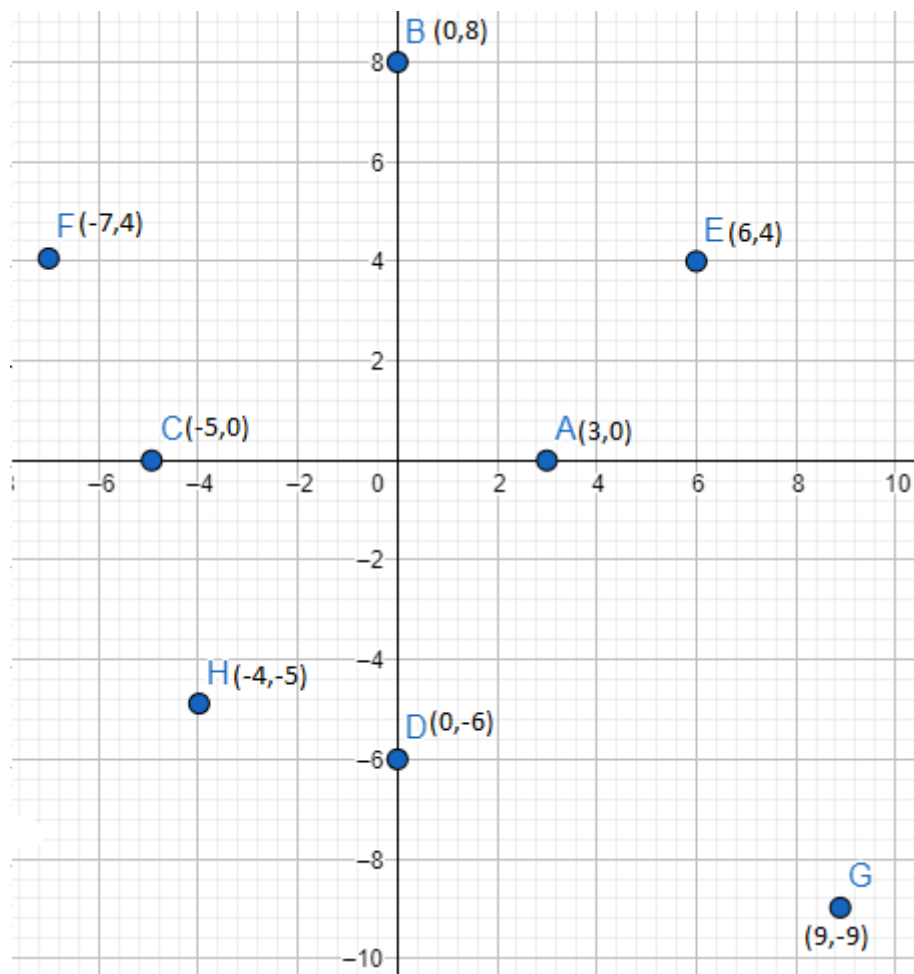
From the graph, we can clearly see the position of points as :

(i) (3, 0): On X - axis

(ii) (0, 8): On Y - axis

(iii) (−5, 0): On X - axis

(iv) (0, −6): On Y - axis

(v) (6, 4): In First Quadrant

(vi) (−7, 4): In second Quadrant

(vii) (9, –9): In IV quadrant

(viii) (–4, –5): In third quadrant

2. Question

On the graph paper, let us draw XOX' & YOY' the two perpendicular axes and plot any 5 points lying in the 3rd quadrant.

Answer

In a graph, the quadrants are divided as follows:
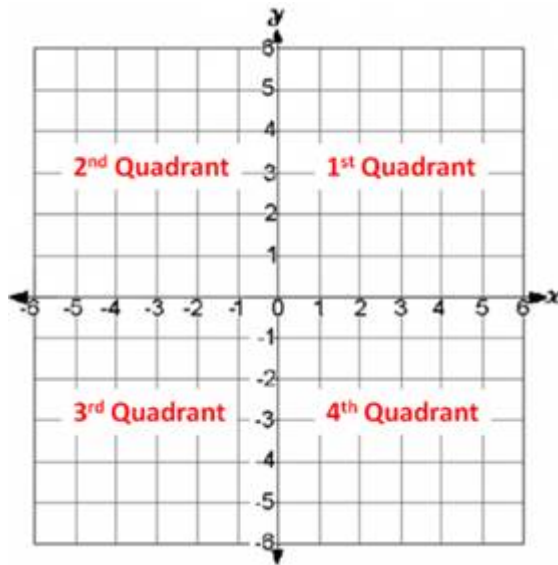
In third quadrant, we can plot 5 points as,
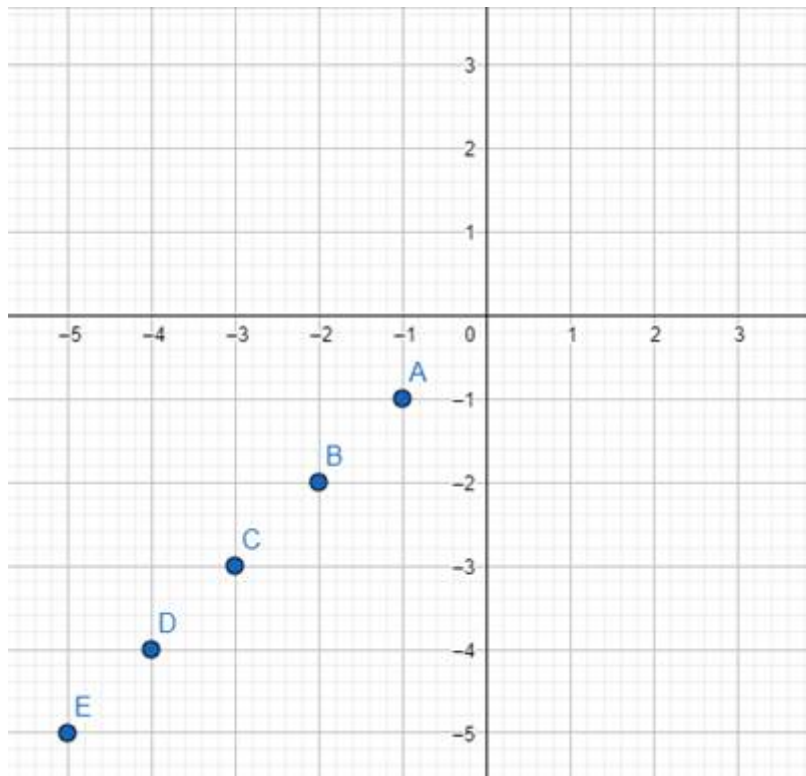
3 A. Question

Let us express the following statements into simultaneous linear equations:

The total price of 3 exercise copies and 2 pens is Rs. 55 and the total price of 4 exercise copies and 3 pens is Rs. 75.

Answer

Let Price of one exercise copy is x Rs and price of pen is y Rs.

In First case:

Number of exercise copies = 3

Number of pens = 2

$\Rightarrow$ Total price of the exercise copies = 3x

$\Rightarrow$ Total price of the pens = 2y

$\Rightarrow$ Total price of exercise copies and pens = 55

$\Rightarrow$ 3x + 2y = 55

In second case:

Number of exercise copies = 4

Number of pens = 3

$\Rightarrow$ Total price of the exercise copies = 4x

$\Rightarrow$ Total price of the pens = 3y

$\Rightarrow$ Total price of exercise copies and pens = 75

$\Rightarrow$ 4x + 3y = 75

3 B. Question

Let us express the following statements into simultaneous linear equations:

Sum of two numbers is 80 and thrice of the difference of those two numbers is 20 more than the larger number.

Answer

Let smaller number is x and larger number is y.

Given sum of numbers = 80

$\Rightarrow$ x + y = 80

Also, Given that thrice of the difference of those two numbers is 20 more than y

$\Rightarrow$ 3(x - y) = 20 + y

$\Rightarrow$ 3x - 3y = 20 + y

$\Rightarrow 3x = 20 + 4y$

$\Rightarrow 4y = 3x - 20$

3 C. Question

Let us express the following statements into simultaneous linear equations:

When 2 is added to both the numerator and denominator of a fraction, its value will be $\dfrac{7}{9}$, and when 3 is subtracted from both the numerator and denominator, its value will be $\dfrac{1}{2}$.

Answer

Let fraction is $\dfrac{x}{y}$

When added 2 to both the numerator and denominator, Value = $\dfrac{7}{9}$

$\Rightarrow \dfrac{x+2}{y+2} = \dfrac{7}{9}$

$\Rightarrow 9x + 18 = 7y + 14$

$\Rightarrow 7y - 9x = 4$

When 3 is subtracted then, Value = $\dfrac{1}{2}$

$\dfrac{x-3}{y-3} = \dfrac{1}{2}$

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

$\Rightarrow y - 2x = -3$

3 D. Question

Let us express the following statements into simultaneous linear equations:

The tens place digit is twice of the units place digit of a two - digit number. If the digits interchange their places, the resulted number will be 27 less than the original number.

Answer

Let unit digit is x and tens place digit is y.

Two Digit number is = 10y + x

Given Tens place digit is twice of the unit place digit,

$\Rightarrow$ y = 2x

If the digits interchange their places, the resulted number is 27 less than the original number.

$\Rightarrow$ 10x + y = 10y + x - 27

$\Rightarrow$ 10y + x - y - 10x = 27

$\Rightarrow$ 9y - 9x = 27

$\Rightarrow$ y - x = 3

4 A. Question

Let us express the following statements into linear equations in two variable and draw the graph of the equations.

At present the age of Sujata's father is more than the age of Sujata by 26 years, [Let us suppose Sujata's father's age is x years and Sujata's age is y years.]

Answer

Let Sujata's age is x years and her father's age is y years.

Given, At present day Sujata's father's age is 26 years more than her.

y = x + 26

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	- 13	- 20
y	13	6
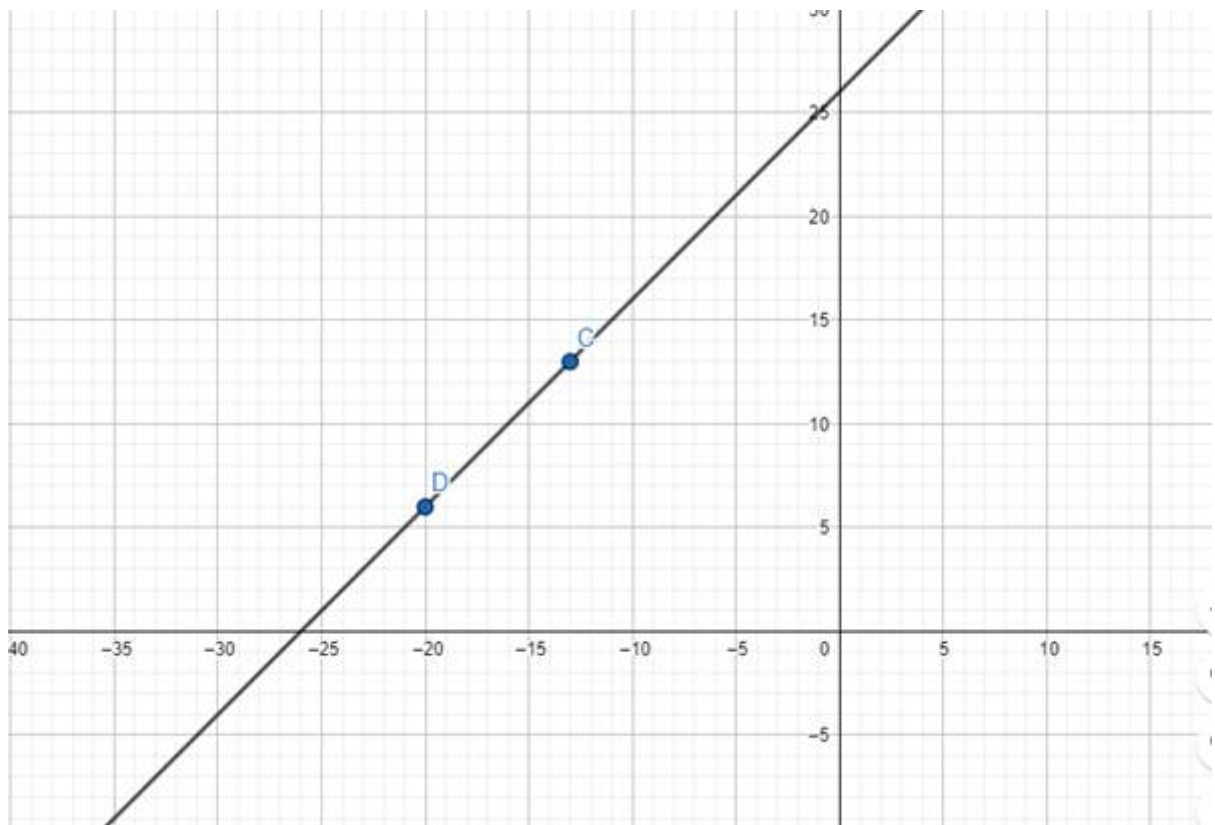
4 B. Question

Let us express the following statements into linear equations in two variable and draw the graph of the equations.

Sum of two numbers is 15.

Answer

Let Numbers are x and y.

x + y = 15

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	15	0
y	0	15
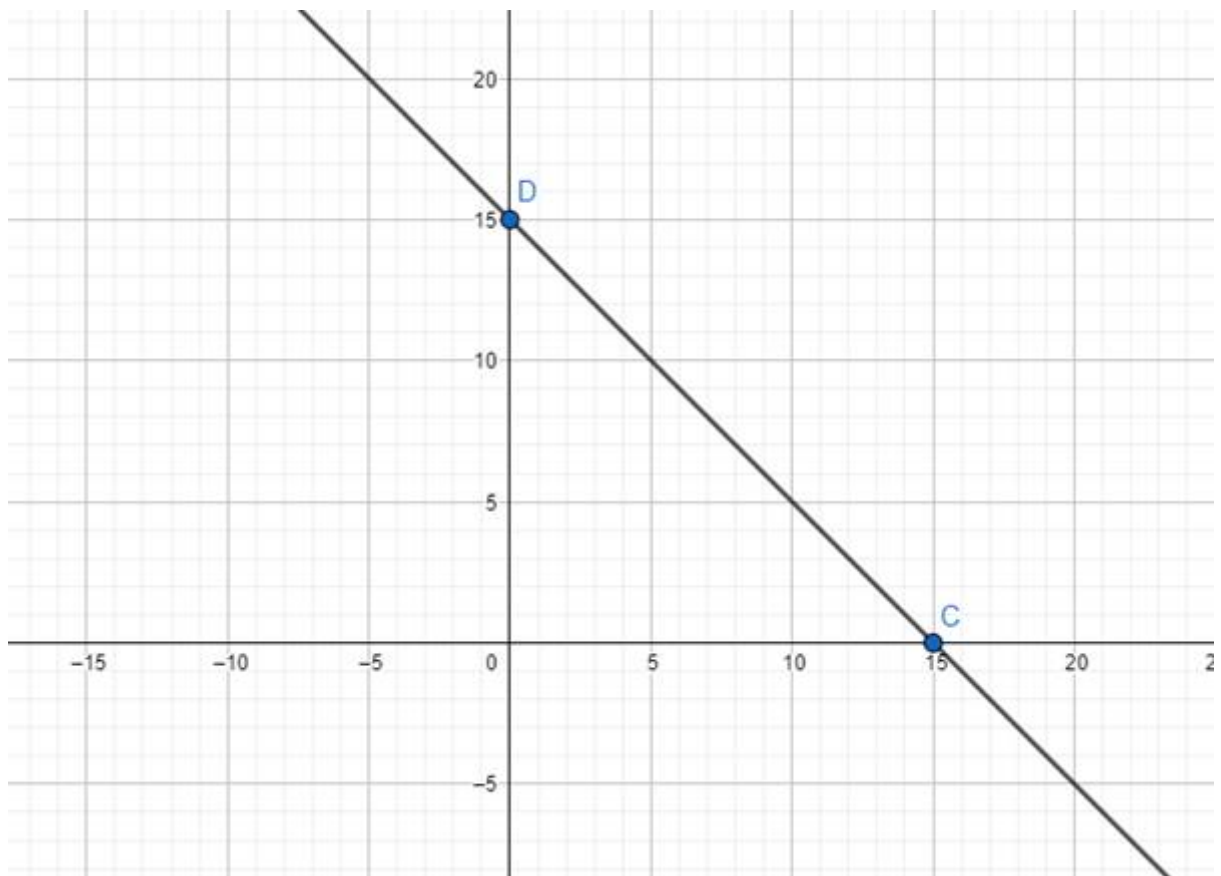
4 C. Question

Let us express the following statements into linear equations in two variable and draw the graph of the equations.

If both the numerator and denominator of a fraction are increased by 2, the fraction will be $\dfrac{7}{9}$

Answer

Let Numerator and denominator are x and y.

Both the Numerator and denominator increased by 2, then fraction become $\dfrac{7}{9}$

$$\Rightarrow \frac{x+2}{y+2} = \frac{7}{9}$$

⇒ 9x + 18 = 7y + 14

⇒ 9x - 7y = - 4

⇒ 7y - 9x = 4

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	- 2	12
y	- 2	16
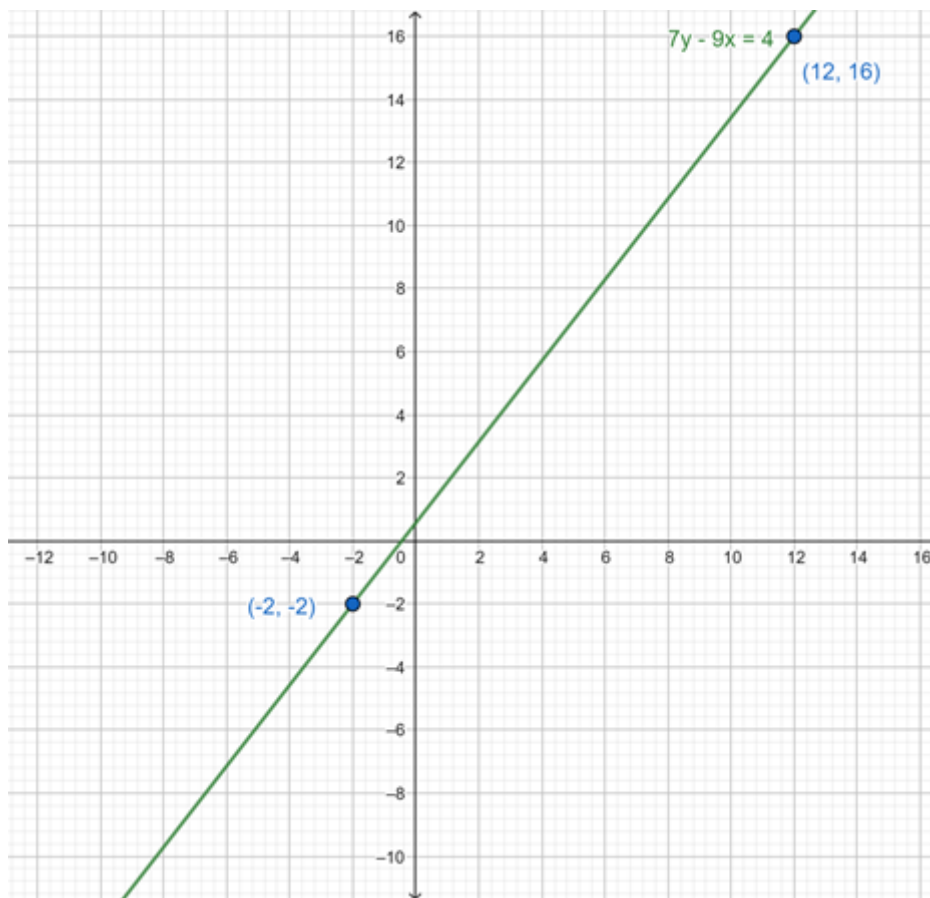
4 D. Question

Let us express the following statements into linear equations in two variable and draw the graph of the equations.

The perimeter of out rectangular yard is 80m.

Answer

Let sides of rectangle are x and y.

Given Perimeter is 80m.

We know that perimeter of the rectangle = 2(sum of sides)

2x + 2y = 80

$\Rightarrow$ x + y = 40

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	20	0
y	0	20
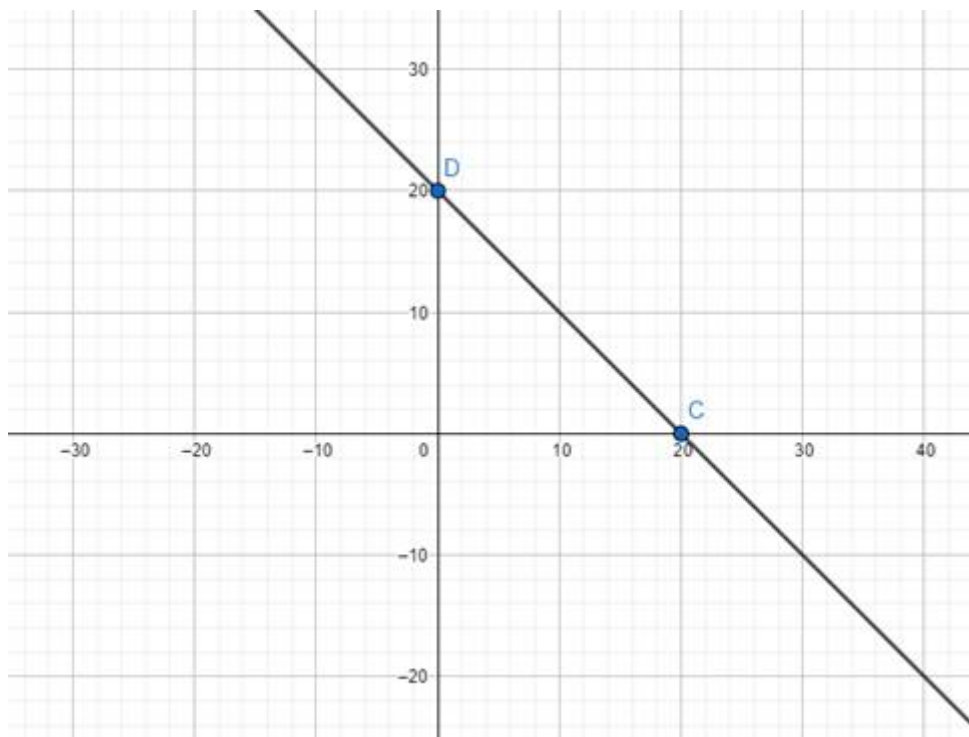
4 E. Question

Let us express the following statements into linear equations in two variable and draw the graph of the equations.

Of the two numbers, 5 times of larger number equals to 8 times of the smaller one.

Answer

Let Numbers are x and y.

Given 5 times larger number is equal to 8 times smaller number.

$\Rightarrow 5y = 8x$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	0	5
y	0	8
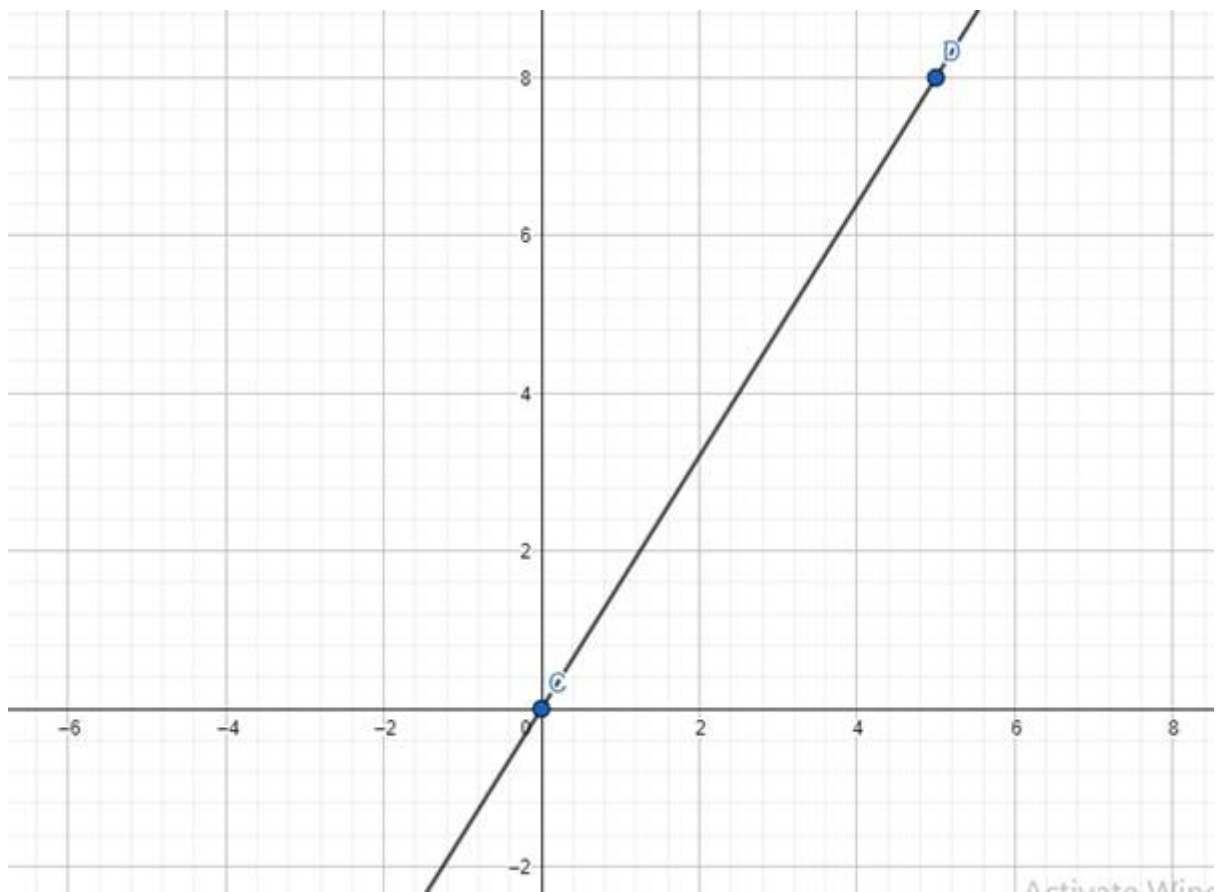
5 A. Question

Let us draw the graph of the following equations:

x = 5

Answer

0.y + 1.x = 5

Coefficient of y is 0 so y can be anything. Equation will not depend on y.

	C	D
X	5	5
y	0	2
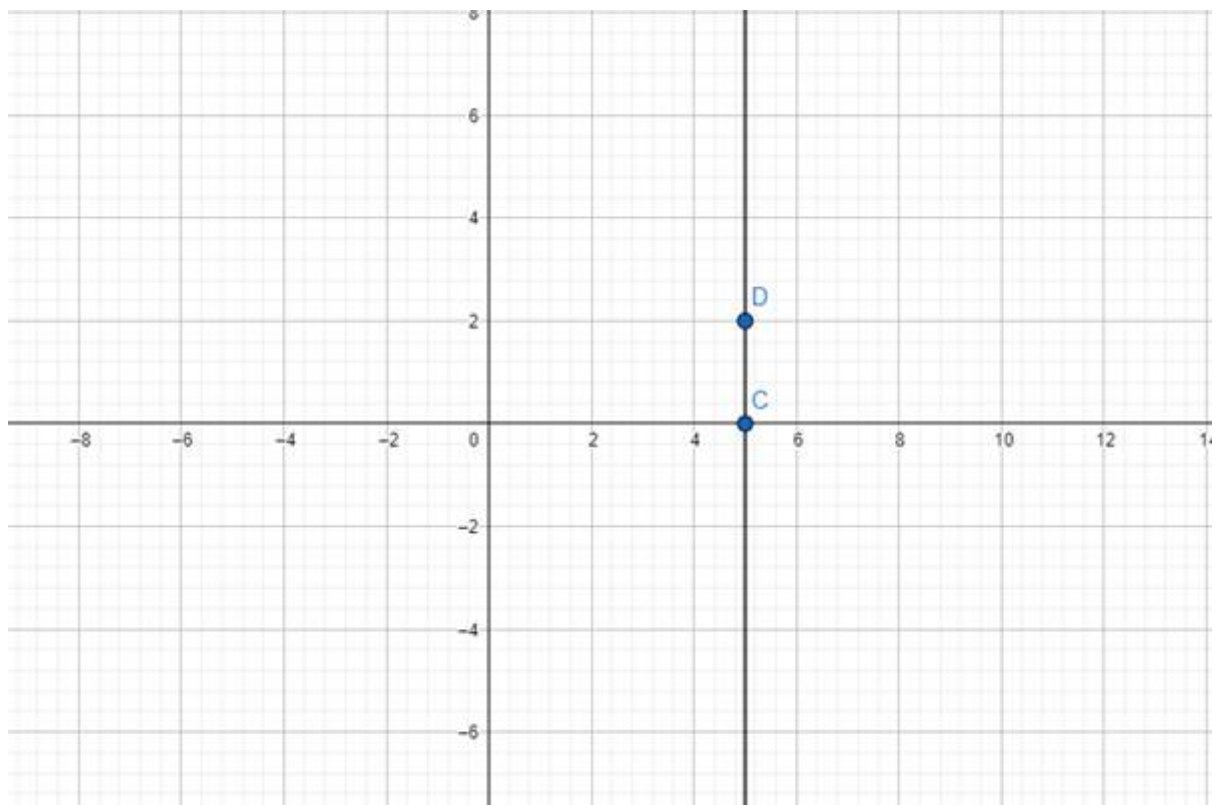
5 B. Question

Let us draw the graph of the following equations:

y + 2 = 0

Answer

$\Rightarrow 1.y + 0.x = -2$

Coefficient of x is 0 so x could be anything.

	C	D
X	5	0
y	- 2	- 2
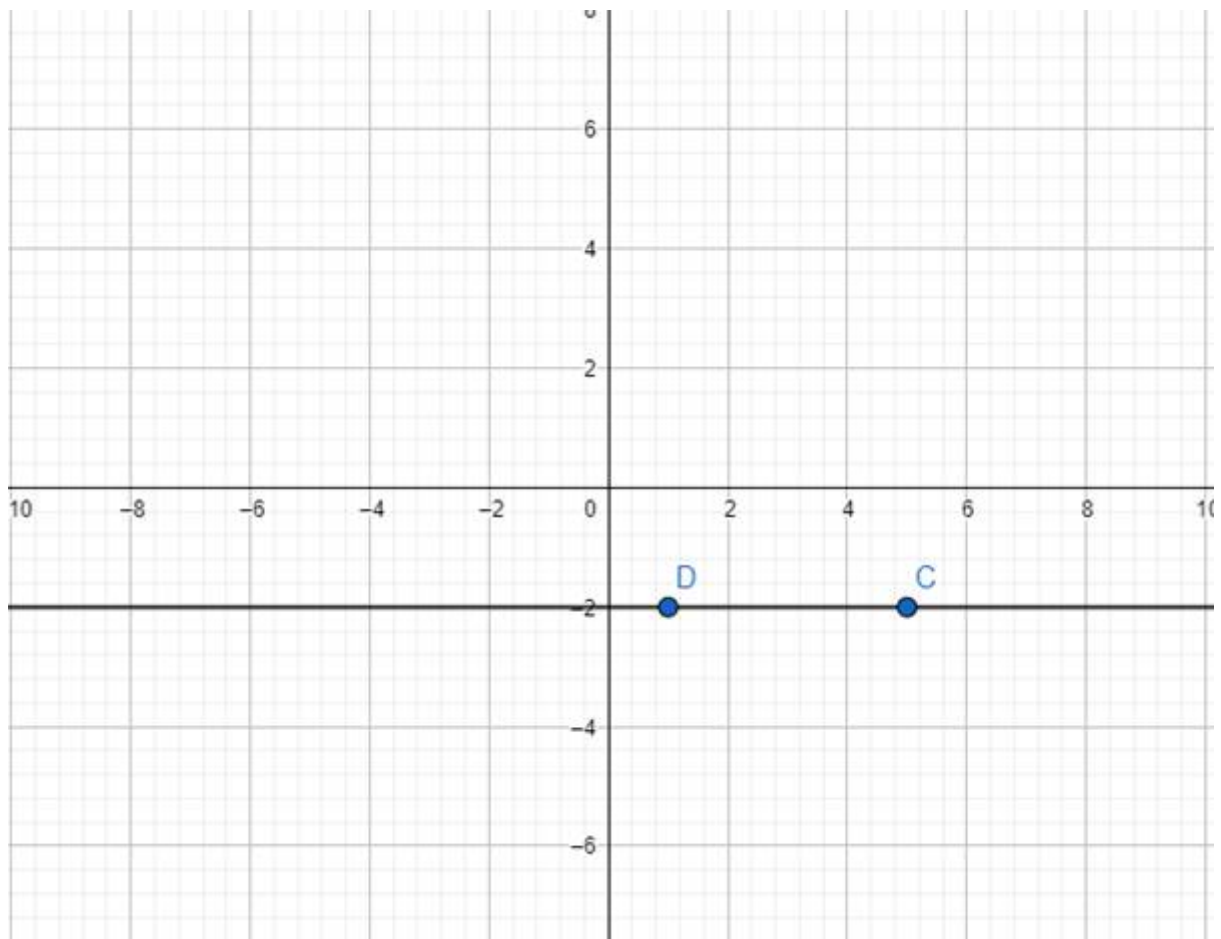
5 C. Question

Let us draw the graph of the following equations:

x = 3 – 4y

Answer

x = 3 - 4y

4y + x = 3

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	3	- 1
y	0	1

5 D. Question

Let us draw the graph of the following equations:

$3x – 7y = 21$

Answer

$3x - 7y = 21$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	7	0
y	0	- 3

5 E. Question

Let us draw the graph of the following equations:

$5x - 3y = 8$

Answer

$5x - 3y = 8$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	4	- 2
y	4	- 6

5 F. Question

Let us draw the graph of the following equations:

$2x + 3y = 11$

Answer

$2x + 3y = 11$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	1	11/2 = 5.5
y	3	0
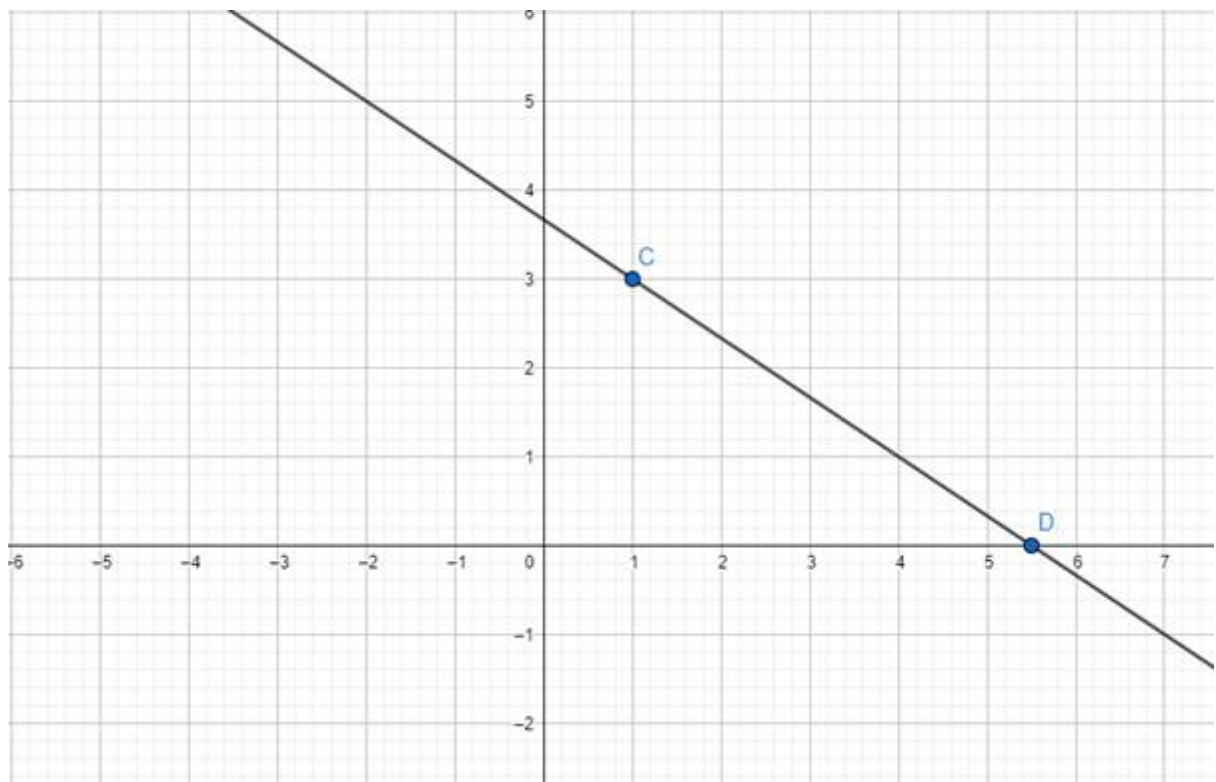
5 G. Question

Let us draw the graph of the following equations:

$$\frac{x}{3} + \frac{y}{4} = 0$$

Answer

$$\frac{x}{3} + \frac{y}{4} = 0$$

To remove the denominator values we need to multiply this equation by 12. {LCM of (3,4)}

4x + 3y = 0

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	- 3	0
y	4	0
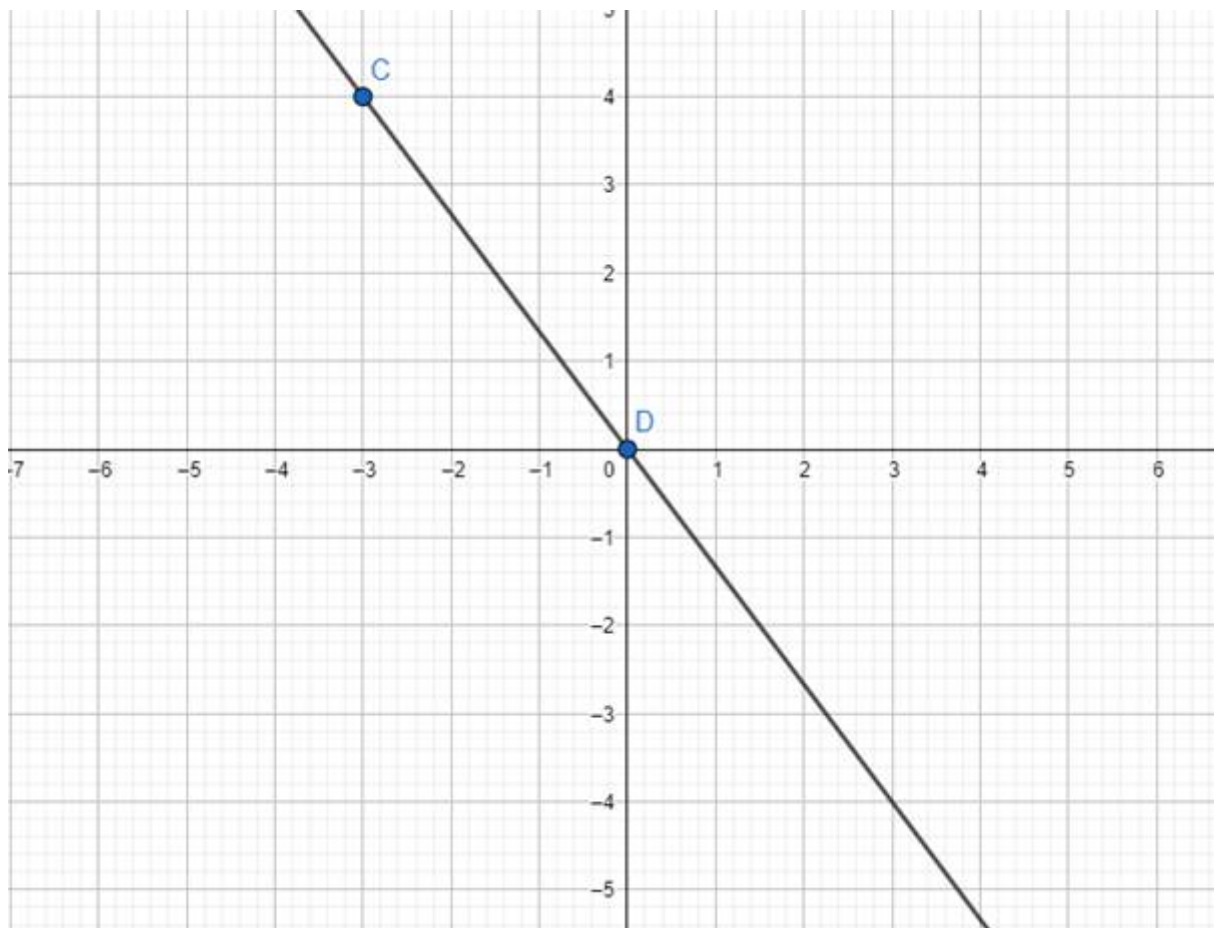
5 H. Question

Let us draw the graph of the following equations:

6x – 7y = 12

Answer

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	- 12	2
y	- 12	0
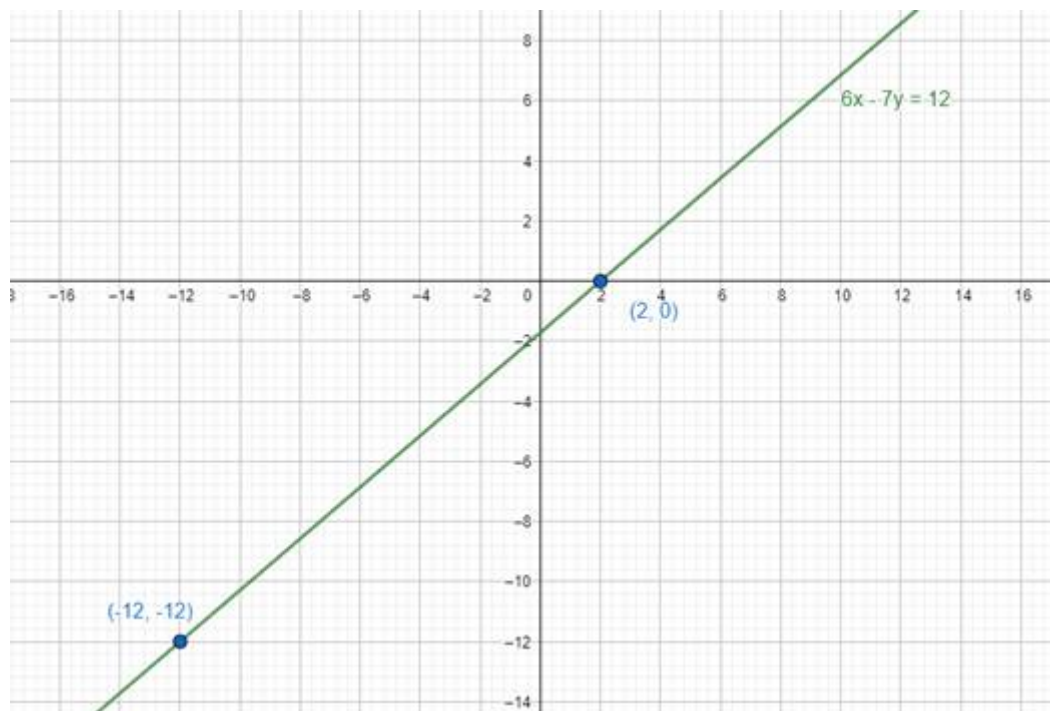
5 I. Question

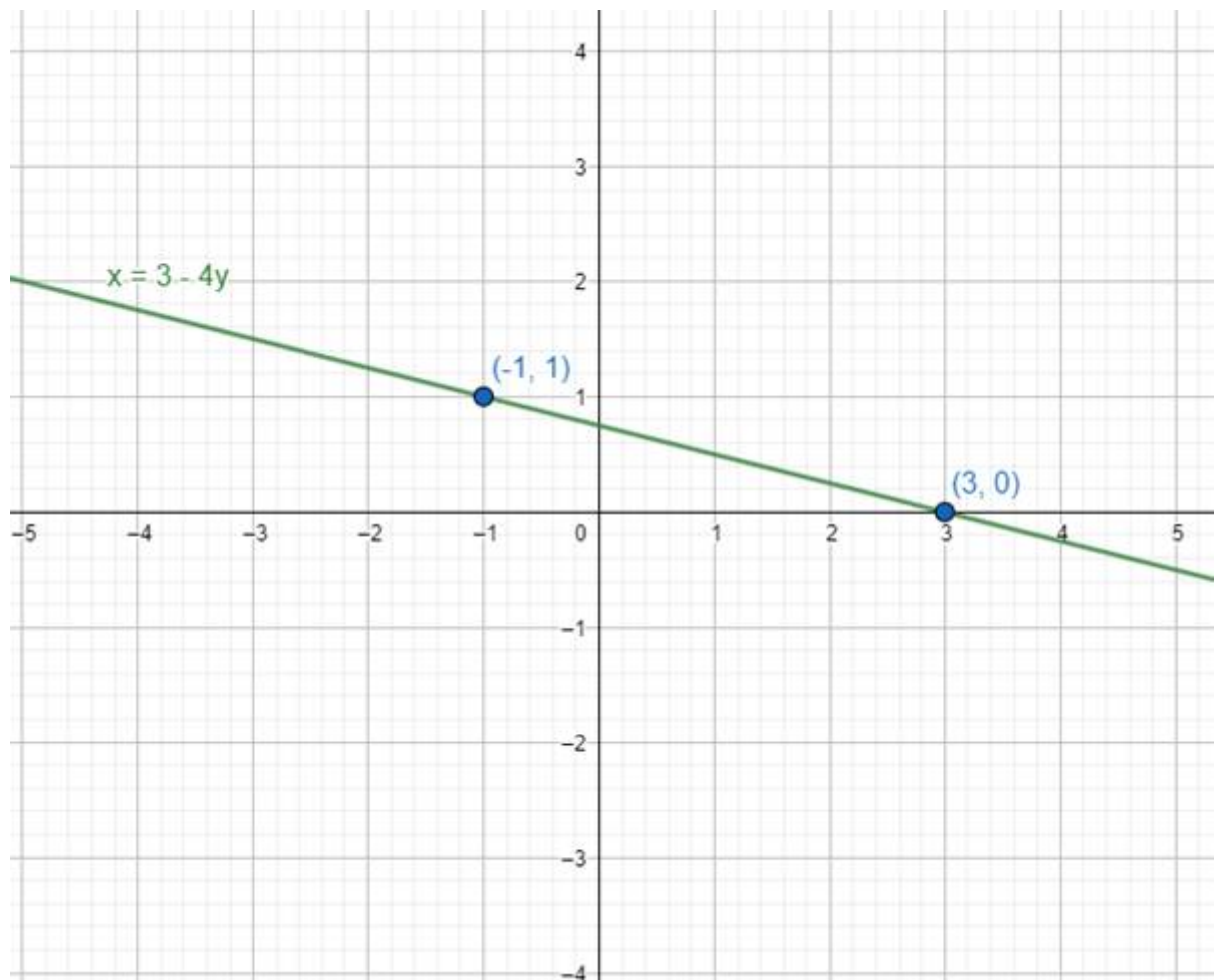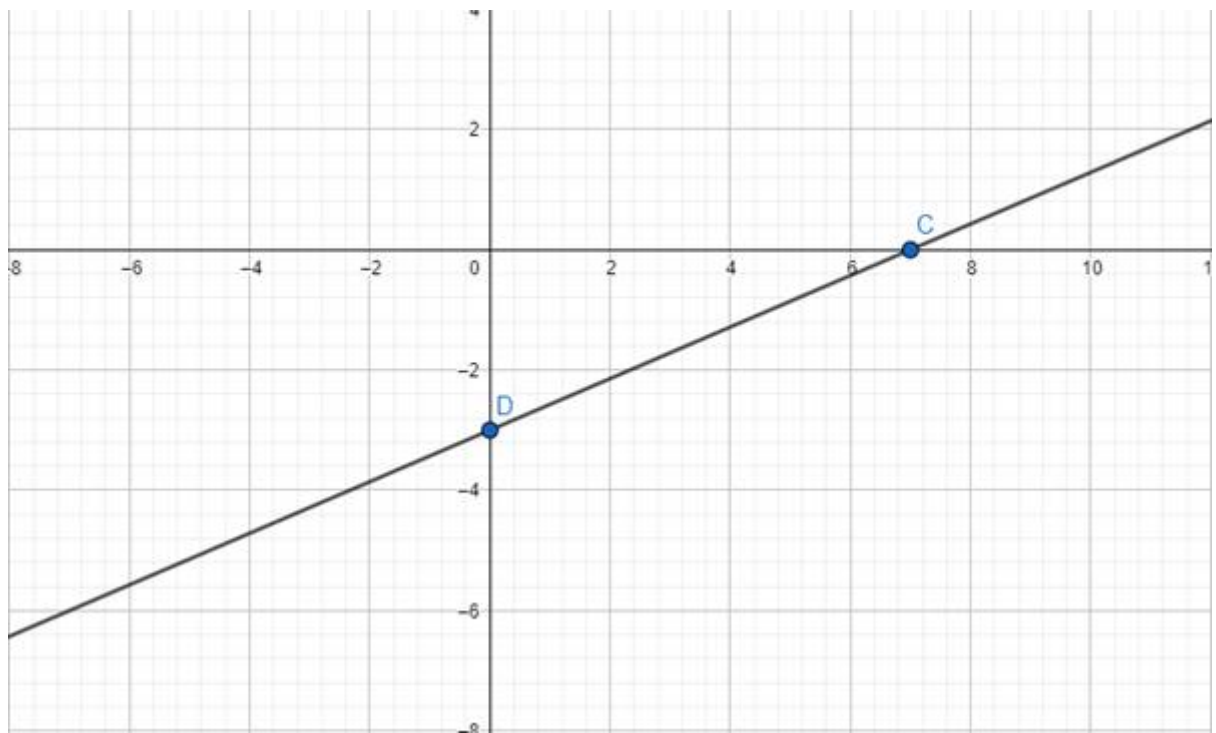Let us draw the graph of the following equations:

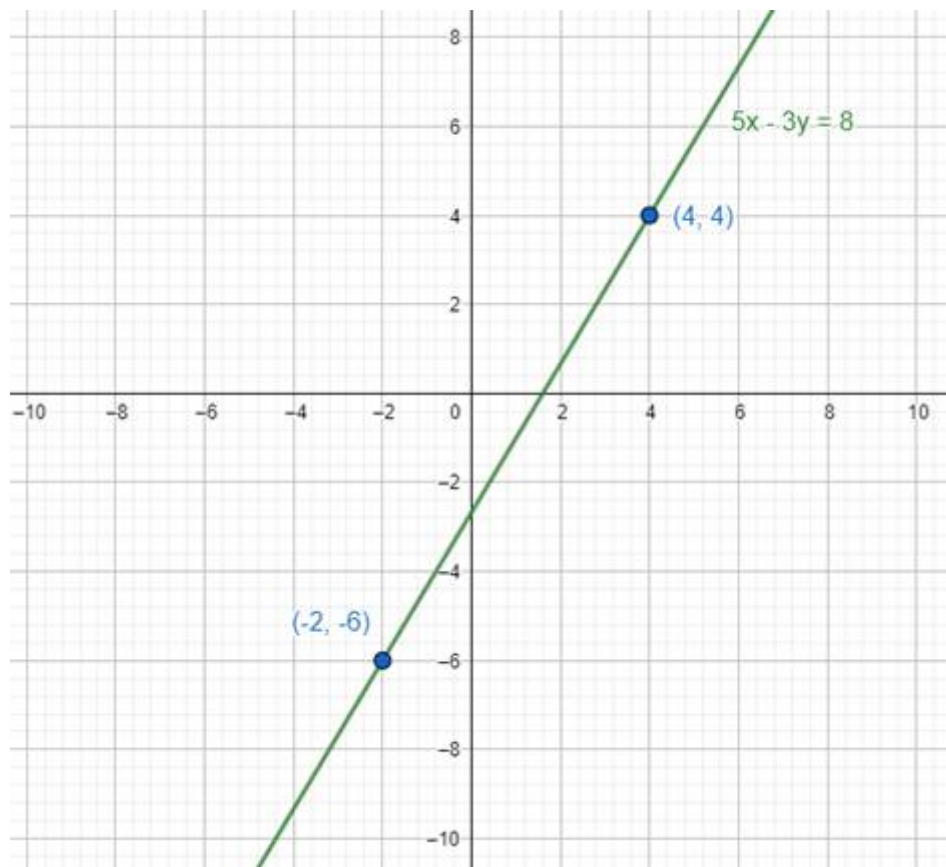$x + y - 10 = 0$

Answer

$x + y = 10$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	10	0
y	0	10
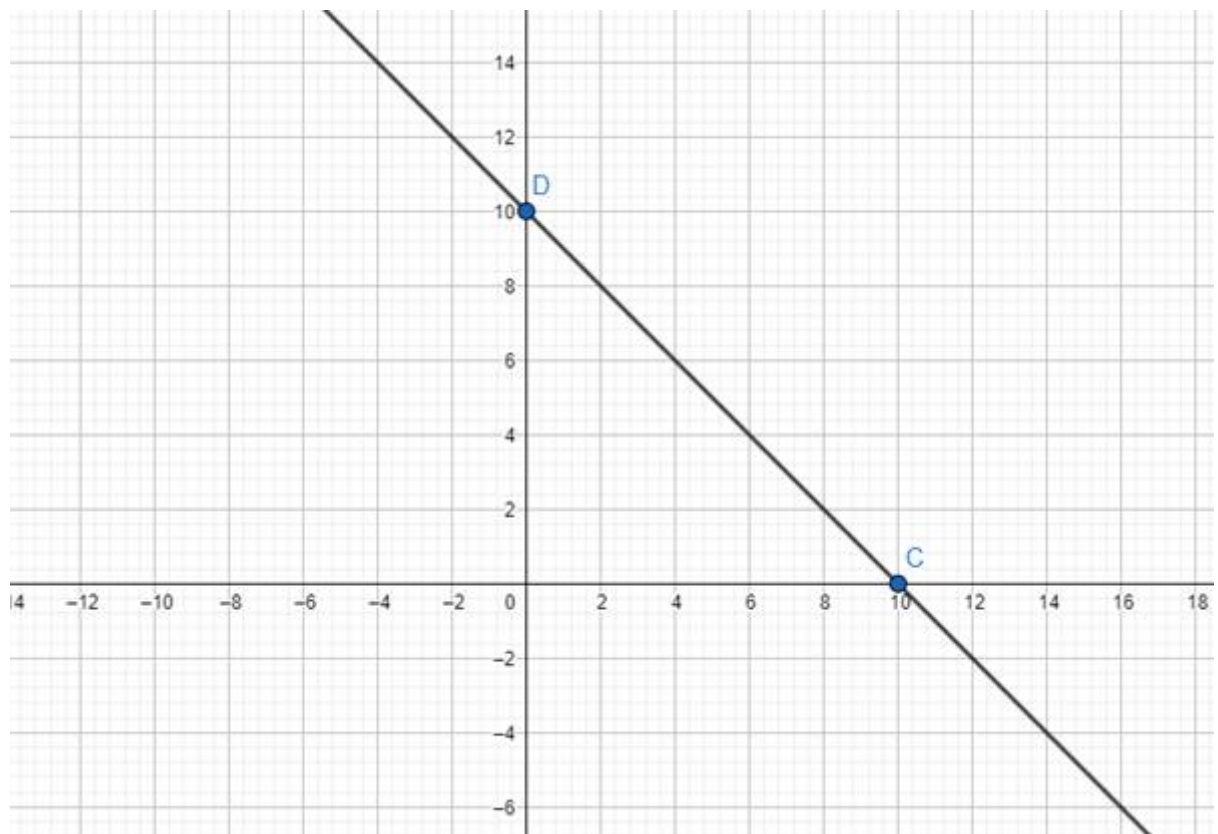
5 J. Question

Let us draw the graph of the following equations:

y = 5x – 3

Answer

y - 5x = - 3

	C	D
X	1	0
y	2	- 3
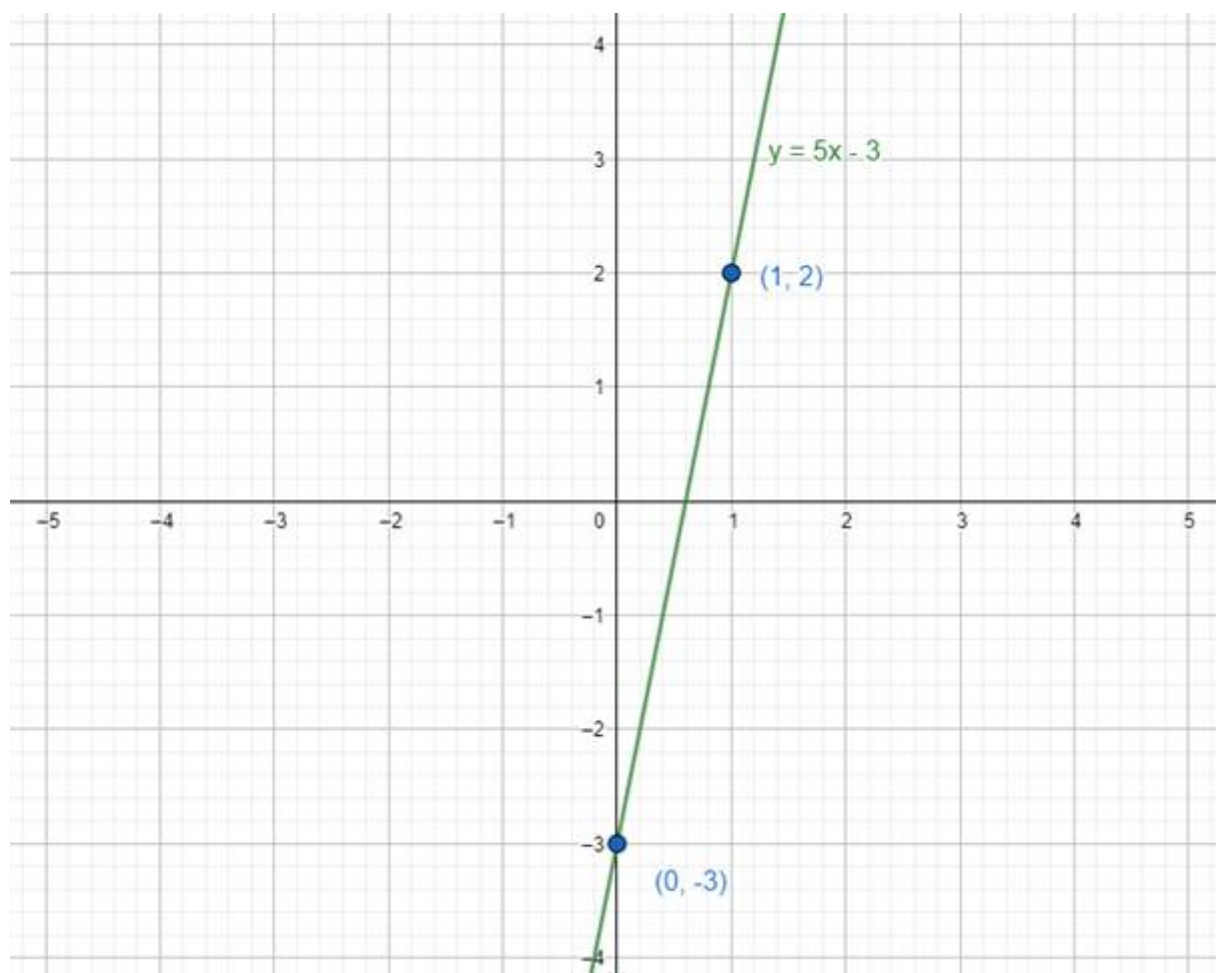
5 K. Question

Let us draw the graph of the following equations:

y = 0

Answer

0.x + 1.y = 0

Coefficient of x is zero so x could be anything

	C	D
X	2	5
Y	0	0
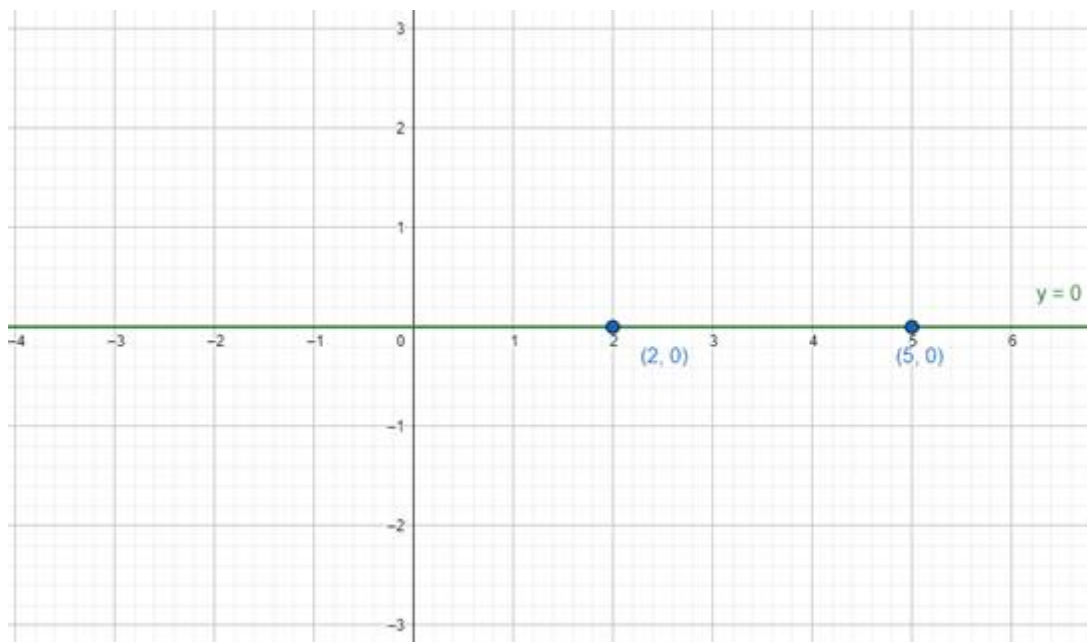
6 A. Question

Let us express the following statements into simultaneous linear equations and solve them graphically.

At present Rajat's maternal uncle is 16 years older than Rajat. 8 years later, his maternal uncle's age will be 2 times of his age. Let us calculate the present age of Rajat and that of his maternal uncle graphically.

Answer

Let Rajat's present age is x Years and His uncle's present age is y years.

Given At present Uncle is 16 years older than Rajat.

y = x + 16

$\Rightarrow$ y - x = 16 …………(1)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	- 16	0
Y	0	16

Given 8 Years later His uncle will be 2 times of his age.

(y + 8) = 2(x + 8)

y + 8 = 2x + 16

$\Rightarrow$ y - 2x = 8 ……...(2)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	- 4	0
Y	0	8
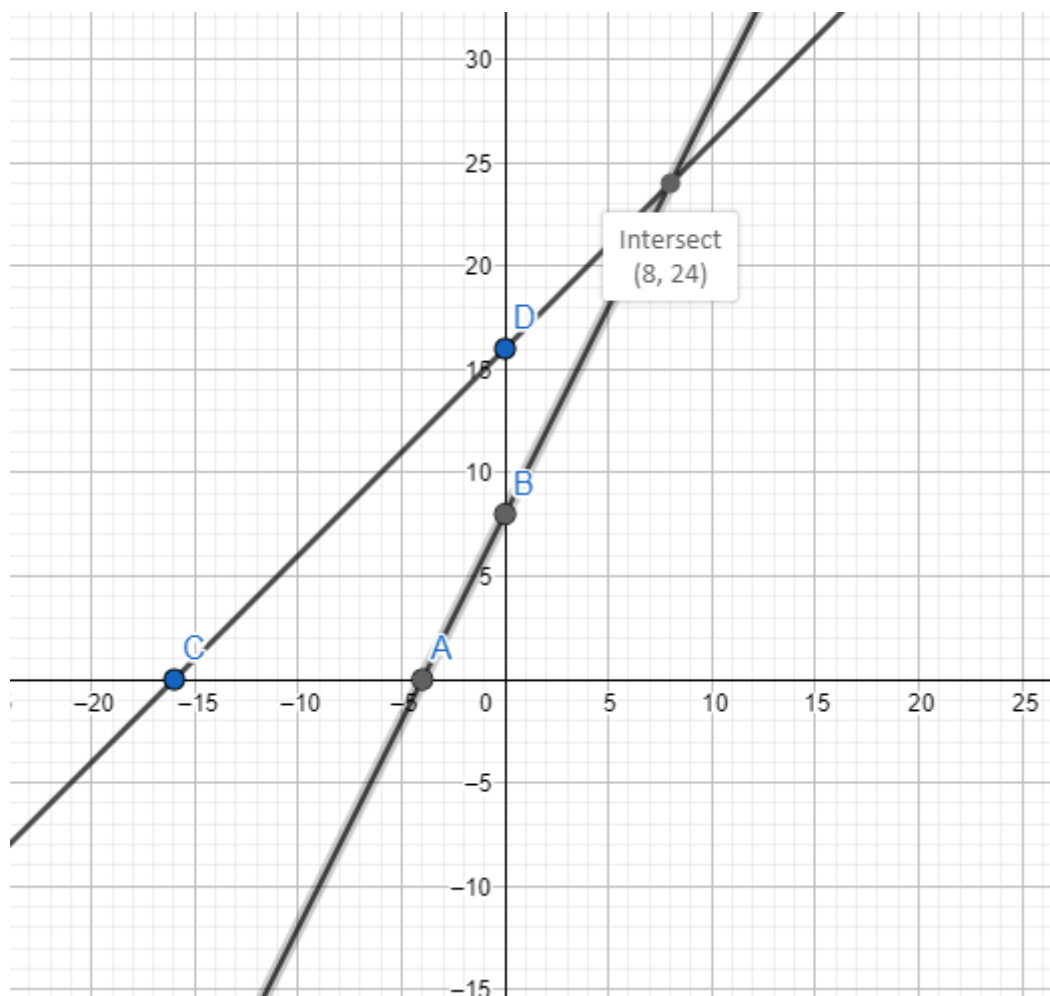
Rajat's Present age is 8 and his uncle's age is 24.

6 B. Question

Let us express the following statements into simultaneous linear equations and solve them graphically.

Sum of two numbers is 15 and difference is 3. Let us write the numbers by solving graphically.

Answer

Let Numbers are x and y.

x + y = 15

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	15	0
Y	0	15

x - y = 3

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	3	0
Y	0	- 3
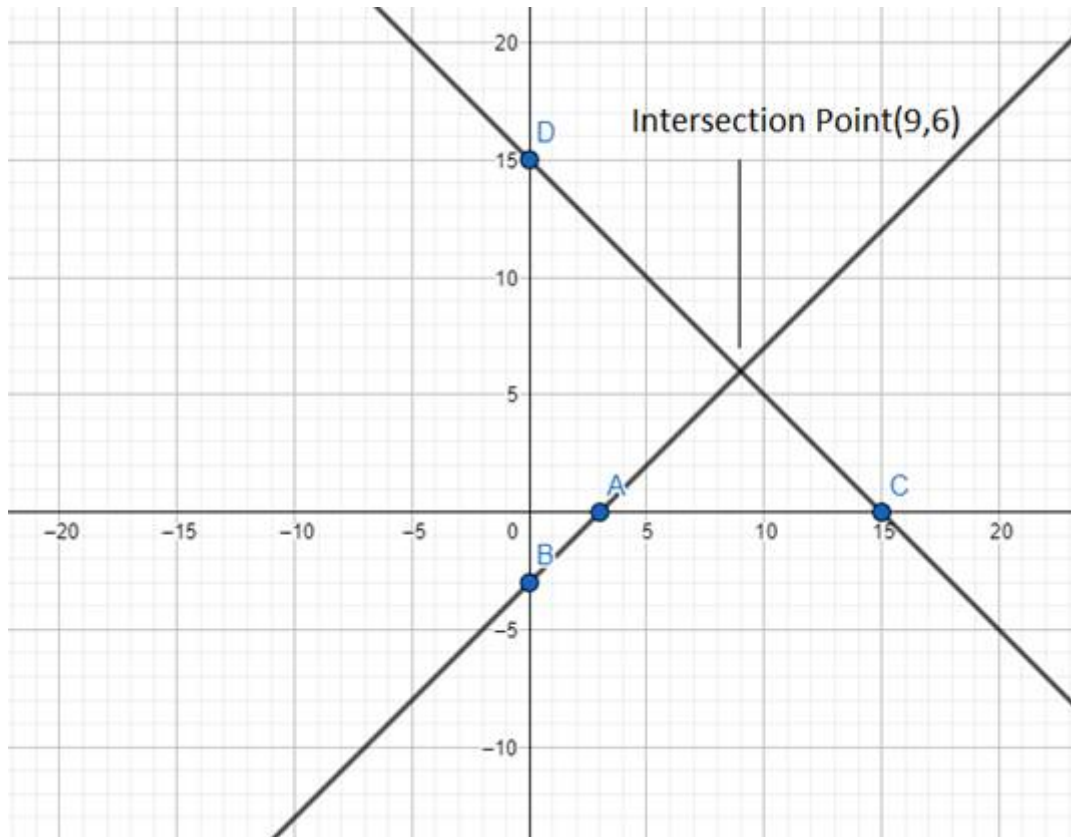
6 C. Question

Let us express the following statements into simultaneous linear equations and solve them graphically.

If 3 is subtracted from numerator and 2 added to the denominator, the fraction will be $\dfrac{1}{3}$ and if 4 is subtracted from numerator and 2 is subtracted from denominator, the fraction will be $\dfrac{1}{2}$. Let us construct the equation of the statement and write the fraction by solving graphically.

Answer

Let Numerator and Denominator are x and y

Given After Subtracting 3 from Numerator and adding 2 from Denominator the fraction is 1/3

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

2x - 6 = y - 2

2x - y = 4 ………(1)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	2	0
Y	0	- 4

Given After Subtracting 4 from Numerator and 2 from Denominator Fraction is 1/2

$$\frac{x - 4}{y - 2} = \frac{1}{2}$$

2x - 8 = y - 2

2x - y = 6 …..(2)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	3	0
Y	0	- 6

.
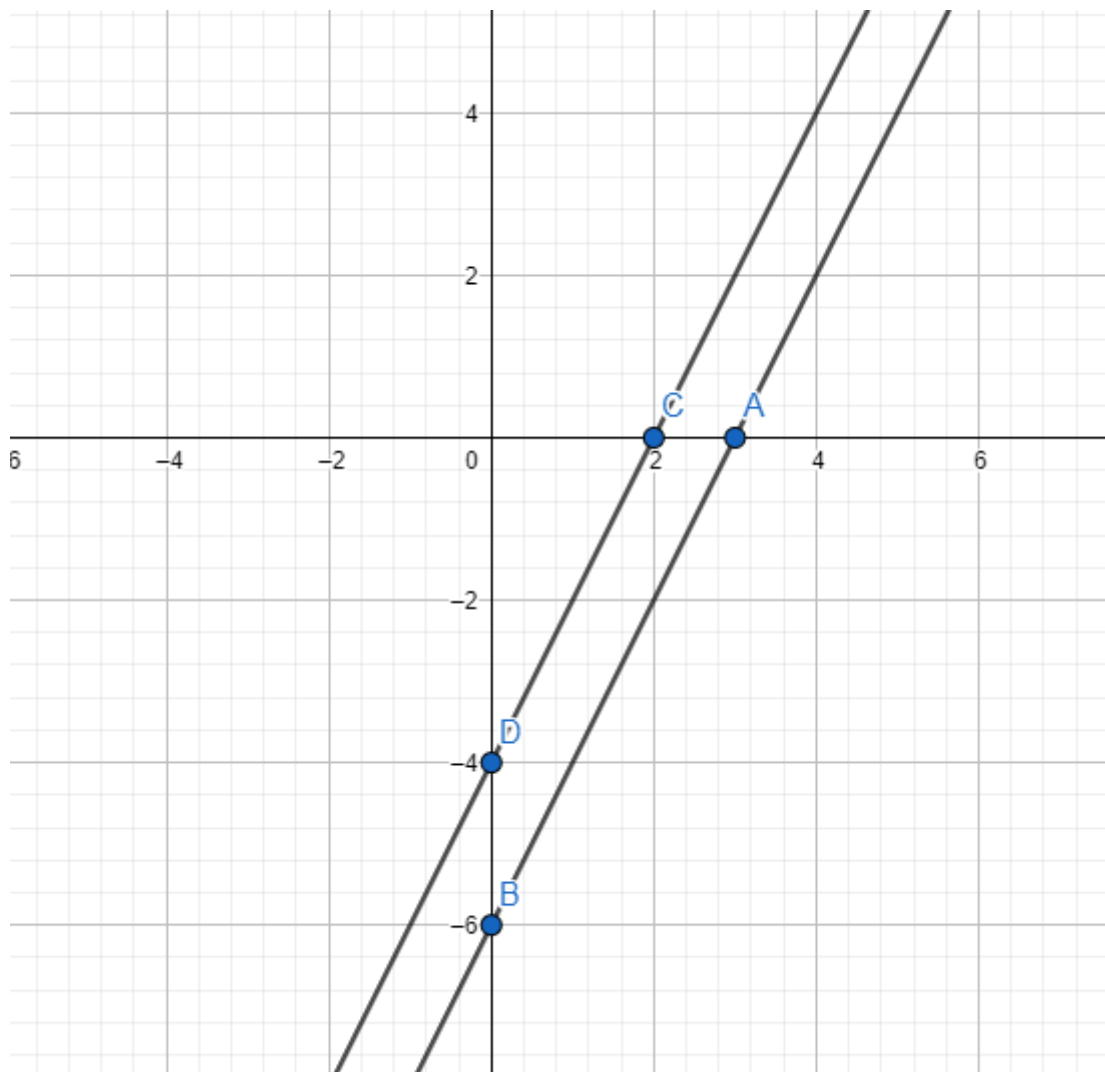
Parallel Lines So there will be no solution.

6 D. Question

Let us express the following statements into simultaneous linear equations and solve them graphically.

The perimeter of Rohit's rectangular garden is 60m. If the length of the garden is increased by 2m and breadth is decreased by 2m, the area of the garden decreased by 24 sq.m. Let us write the length and breadth of the garden by solving graphically.

Answer

Let sides of the rectangular garden are x meters and y meters.

Given perimeter = 60

$2x + 2y = 60$

$x + y = 30$ .....(1)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	30	0
Y	0	30

Given Length is increased by 2m and breadth is decreased by 2m then area of the garden is decreased by 24m^2.

(x + 2)(y - 2) = xy - 24

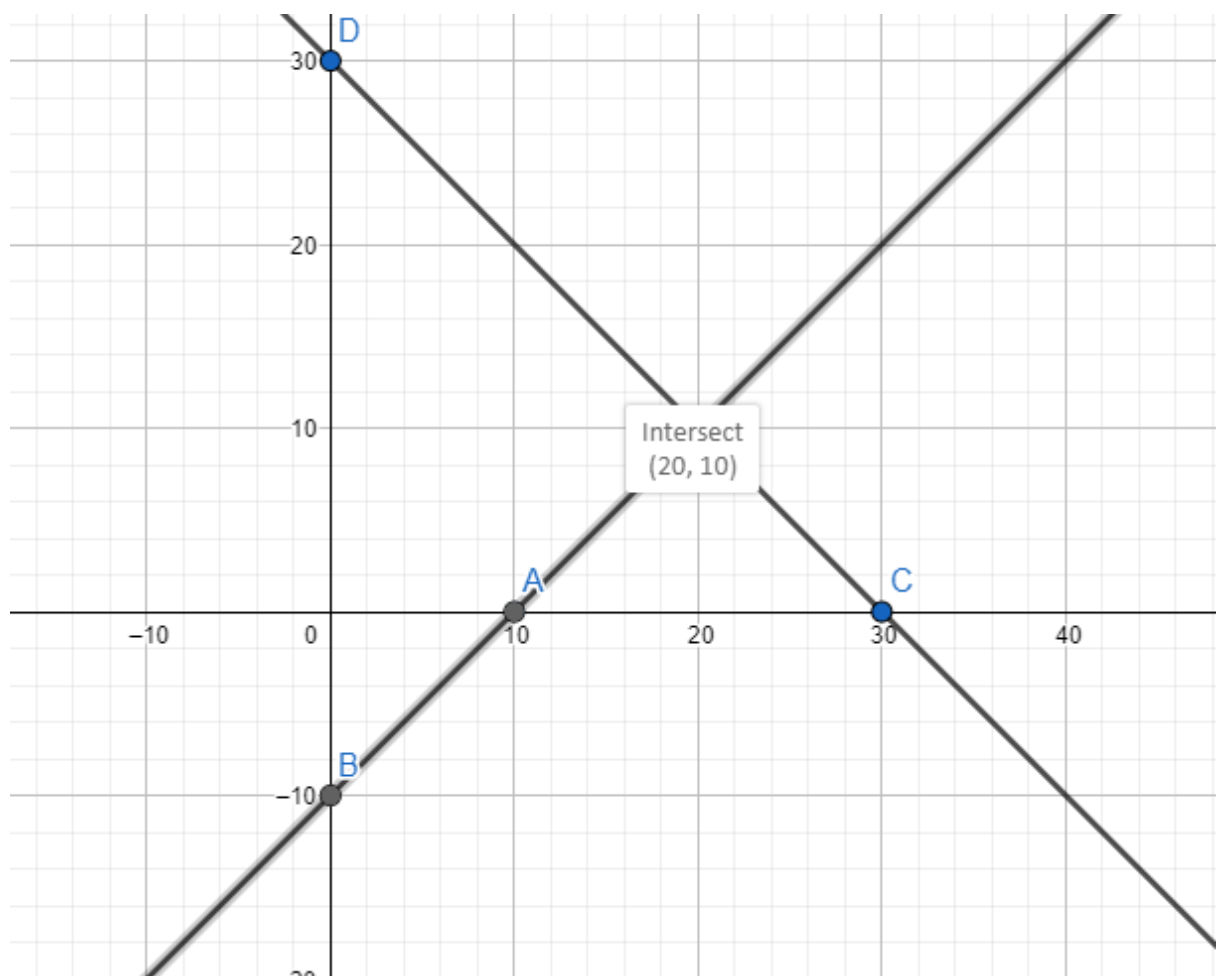xy - 2x + 2y - 4 = xy - 24

2y - 2x = - 20

x - y = 10 ....(2)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	10	0
Y	0	- 10

Sides of the rectangular garden are 20m and 10m.

6 E. Question

Let us express the following statements into simultaneous linear equations and solve them graphically.

A boat covers 96 km. in 16 hrs. while travelling downstream and it covers 16 km. in 8 hrs. while travelling upstream. Let us write the speed of the boat in still water and the speed of the stream by solving graphically.

Answer

Let us suppose the speed of the boat in still water = x km/hr. and the speed of the stream = y

km/hr.

the speed of the boat in downstream = (x + y) km/hr.

$$speed = \frac{Distance}{time}$$

$$x + y = \frac{96}{16}$$

x + y = 6 ....(1)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	6	0
Y	0	6

the speed of the boat in upstream = (x – y) km/hr.

$$x - y = \frac{16}{8}$$

x - y = 2 ....(2)

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	2	0
Y	0	- 2
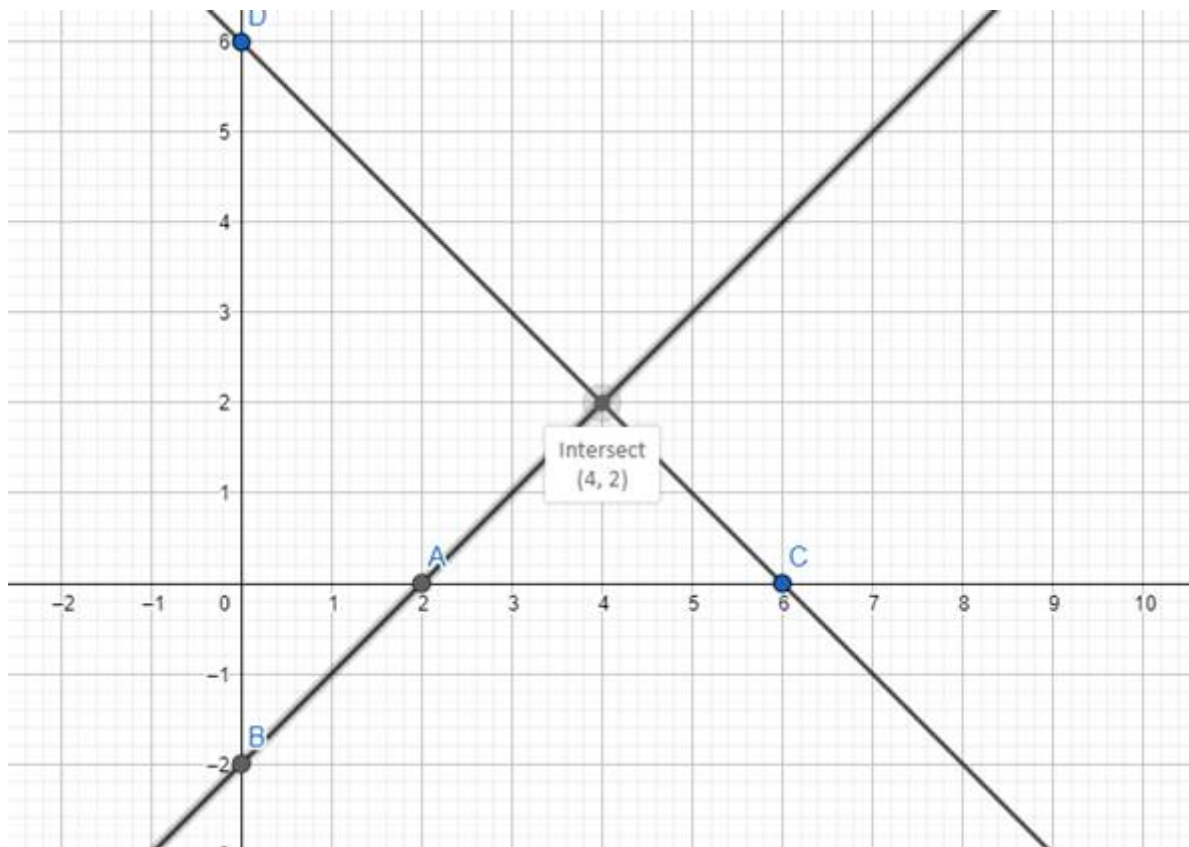
Boat's speed in still water is 4km/hr and stream speed is 2km/hr.

7 A. Question

Let us draw the graph of the following simultaneous linear equations and determine the coordinates of the point of intersection.

x = 0 and 2x + 3y = 15

Answer

0.y + 1.x = 0

Coefficient of y is zero so y could be anything.

	C	D
X	0	0
Y	0	- 2

2x + 3y = 15

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	15/2	0
Y	0	5

Intersection Point (0,5)
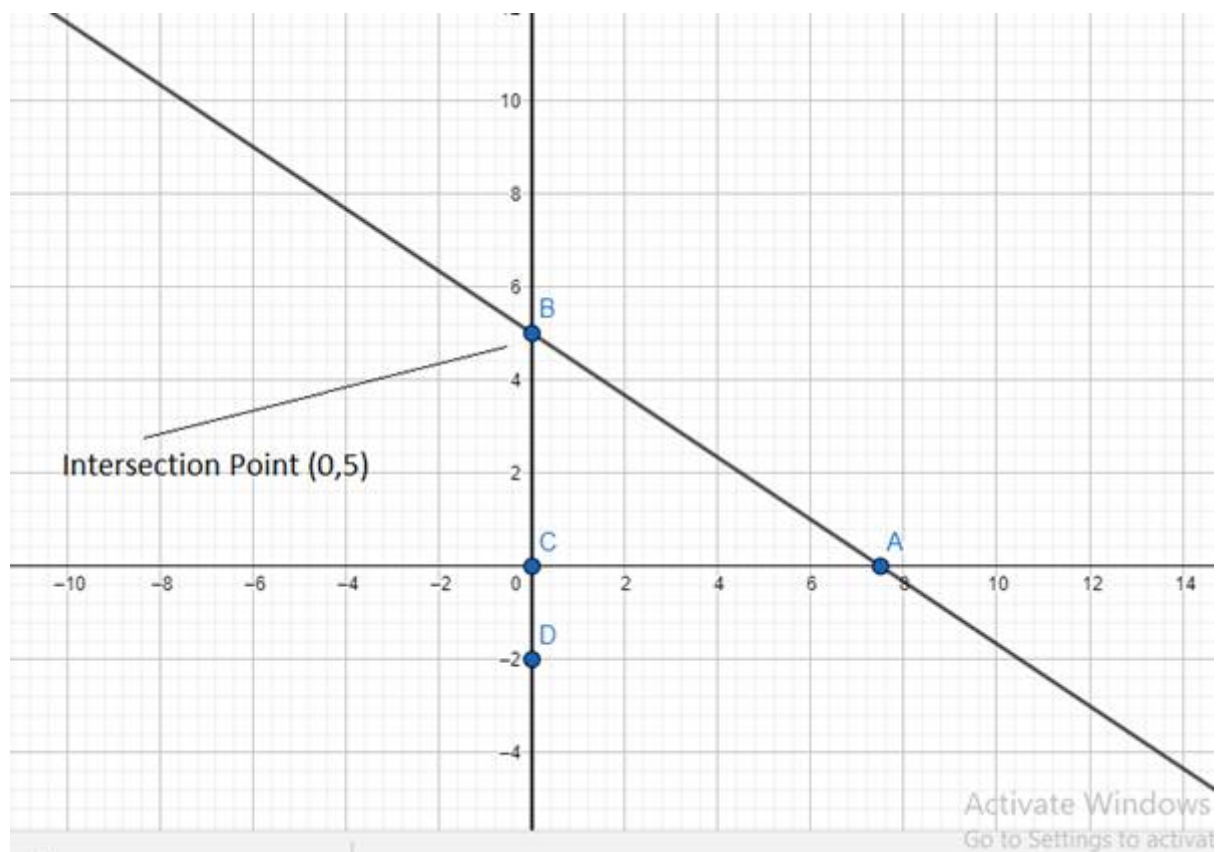
7 B. Question

Let us draw the graph of the following simultaneous linear equations and determine the coordinates of the point of intersection.

y = 5 and 2x + 3y = 11

Answer

y = 5

	C	D
X	15/2	0
Y	5	5

2x + 3y = 11

	A	B
X	1	11/2
Y	3	0

Intersection Point (0,5)

7 C. Question

Let us draw the graph of the following simultaneous linear equations and determine the coordinates of the point of intersection.

x + y = 12 and x – y = 2

Answer

x + y = 12

	C	D
X	6	0
Y	0	6

x – y = 2

	A	B
X	2	0
Y	0	- 2
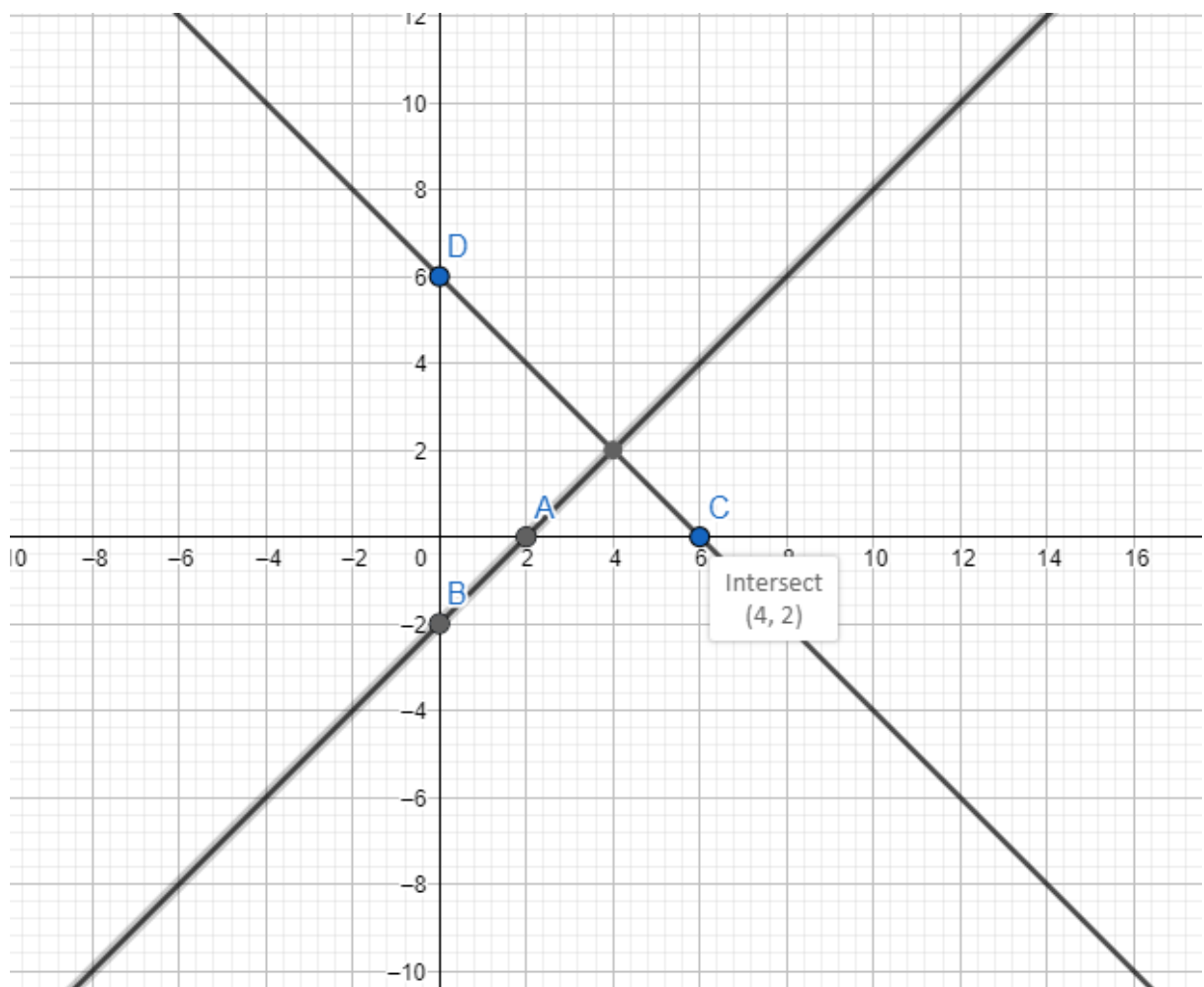
7 D. Question

Let us draw the graph of the following simultaneous linear equations and determine the coordinates of the point of intersection.

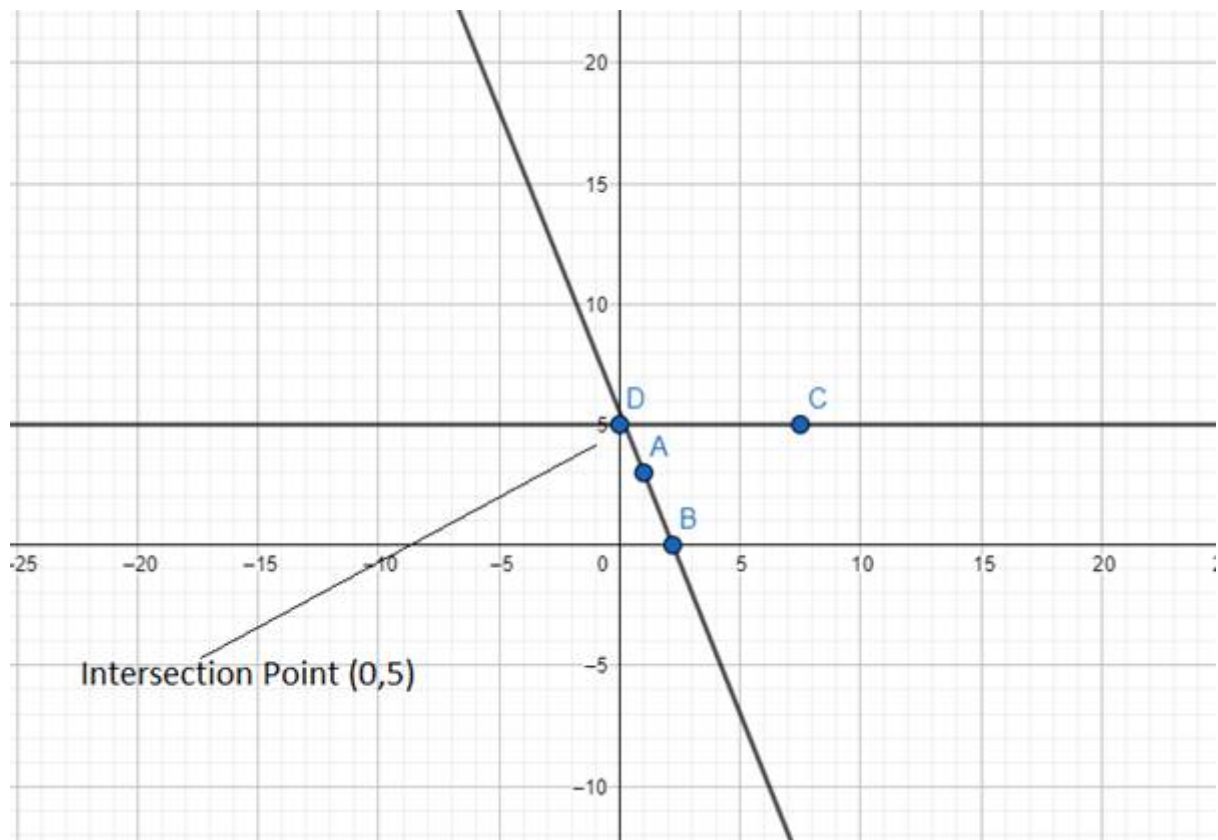$3x - 5y = 16$ and $2x - 9y = 5$

Answer

$3x - 5y = 16$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	2	0
Y	- 2	- 16/5

$2x - 9y = 5$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	D
X	5/2	- 2
Y	0	- 1

Intersection Point(1.33,-0.26)
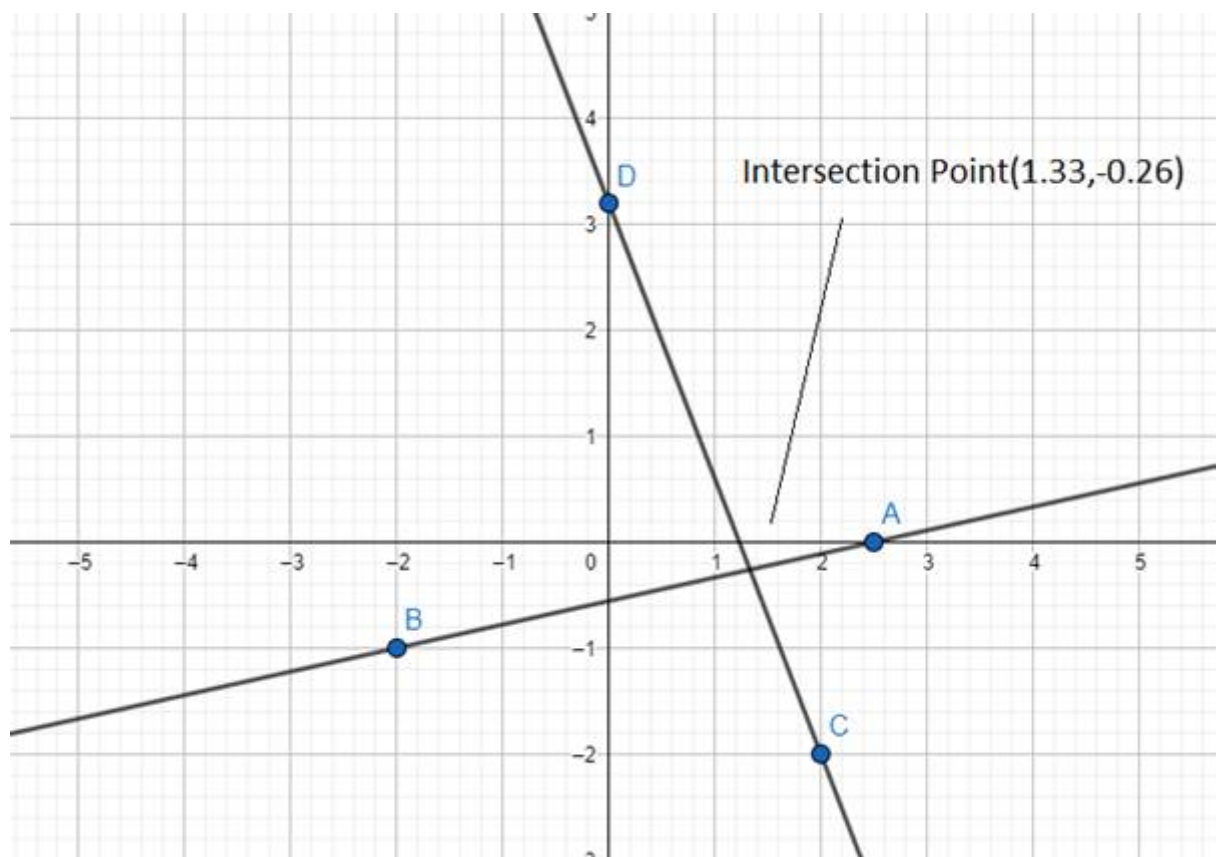
8 A. Question

Let us solve the following equations graphically.

4x – y = 3; 2x + 3y = 5

Answer

4x – y = 3

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	3/4	0
Y	0	- 3

2x + 3y = 5

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	5/2	0
Y	0	5/3
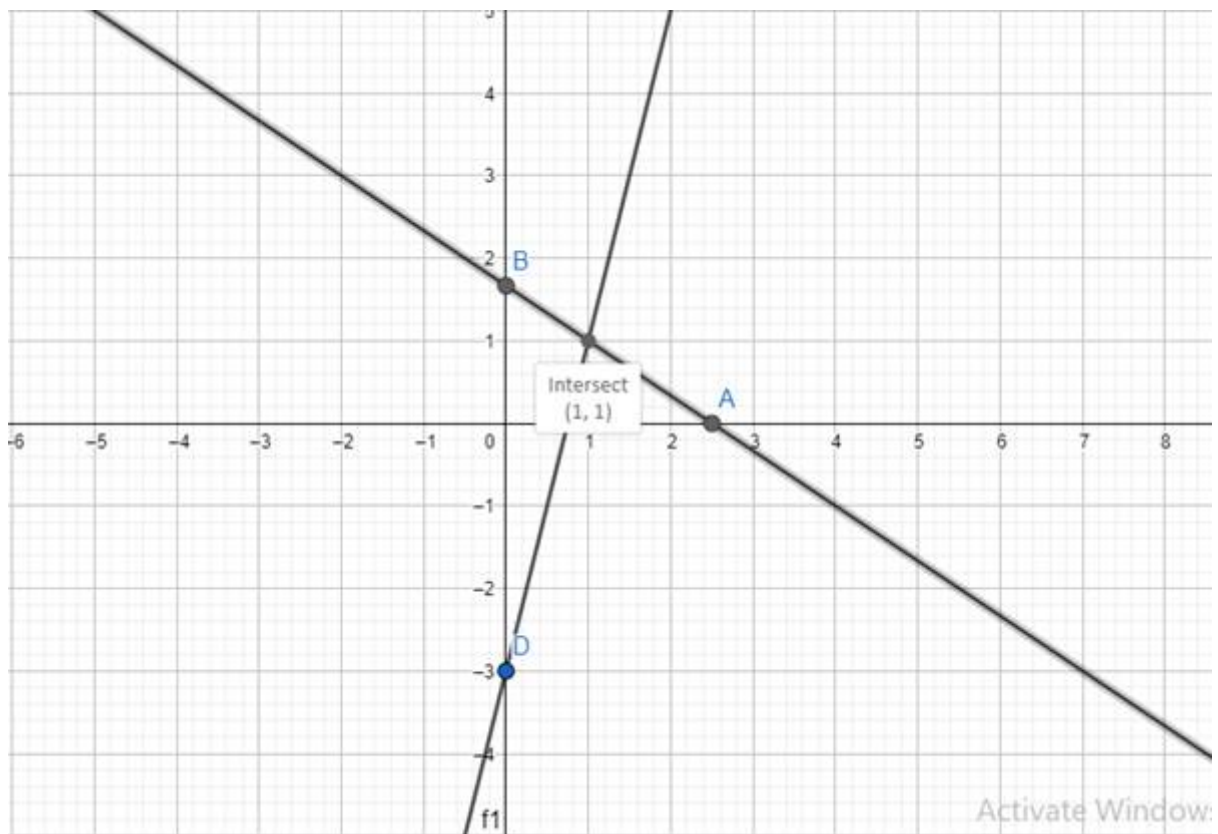
8 B. Question

Let us solve the following equations graphically.

3x – y = 5; 4x + 3y = 11

Answer

3x – y = 5

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	5/3	0
Y	0	- 5

4x + 3y = 11

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	1/2	2
Y	3	1

Intersection Point (2,1)
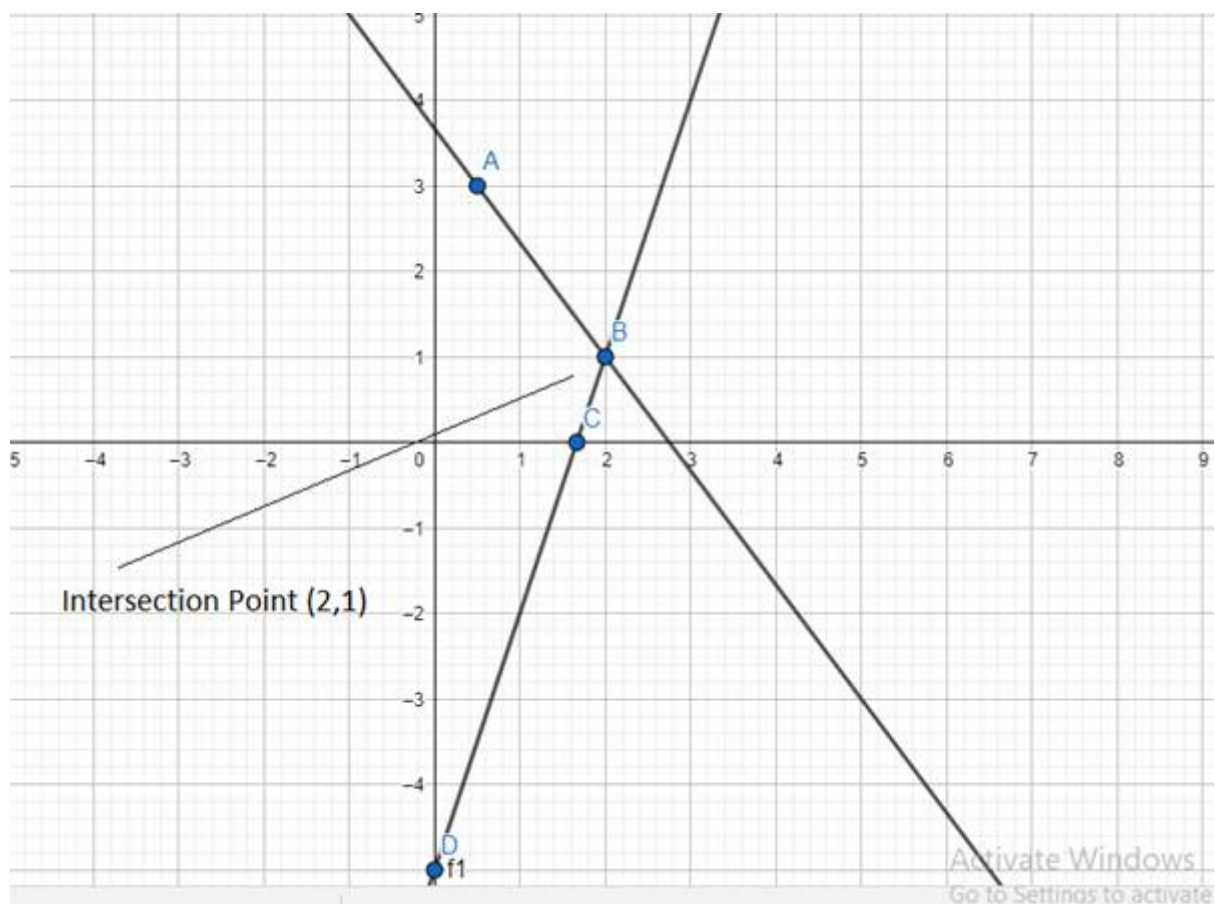
8 C. Question

Let us solve the following equations graphically.

3x – 2y = 1; 2x – y = 3

Answer

3x – 2y = 1

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	1	0
Y	1	- 1/2

2x – y = 3

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	1	0
Y	1	- 3

Intersection Point (1,1)
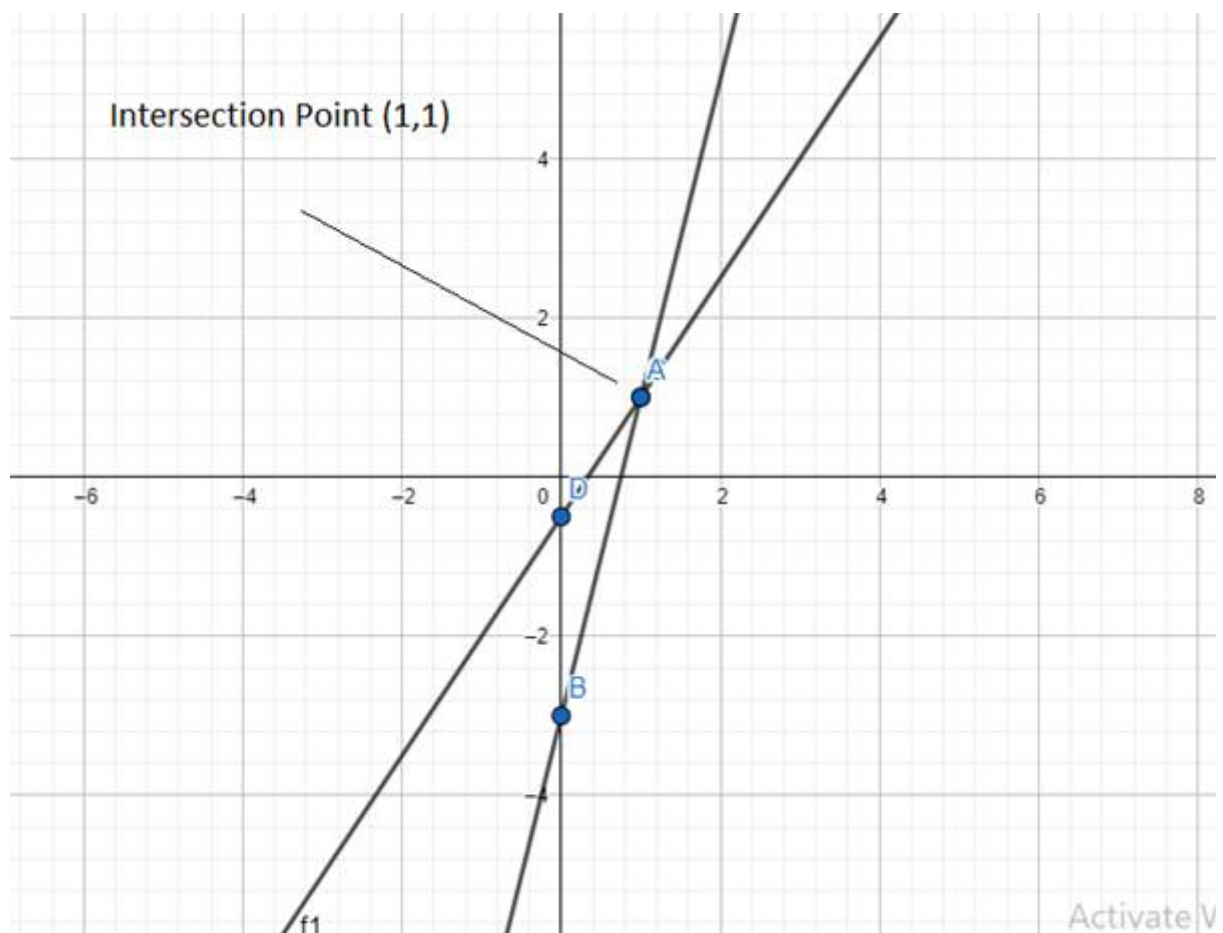
8 D. Question

Let us solve the following equations graphically.

2x + 3y = 12; 2x = 3y

Answer

2x + 3y = 12

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	6	0
Y	0	4

2x = 3y

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	0	3
Y	0	2

Intersection Point(3,2)
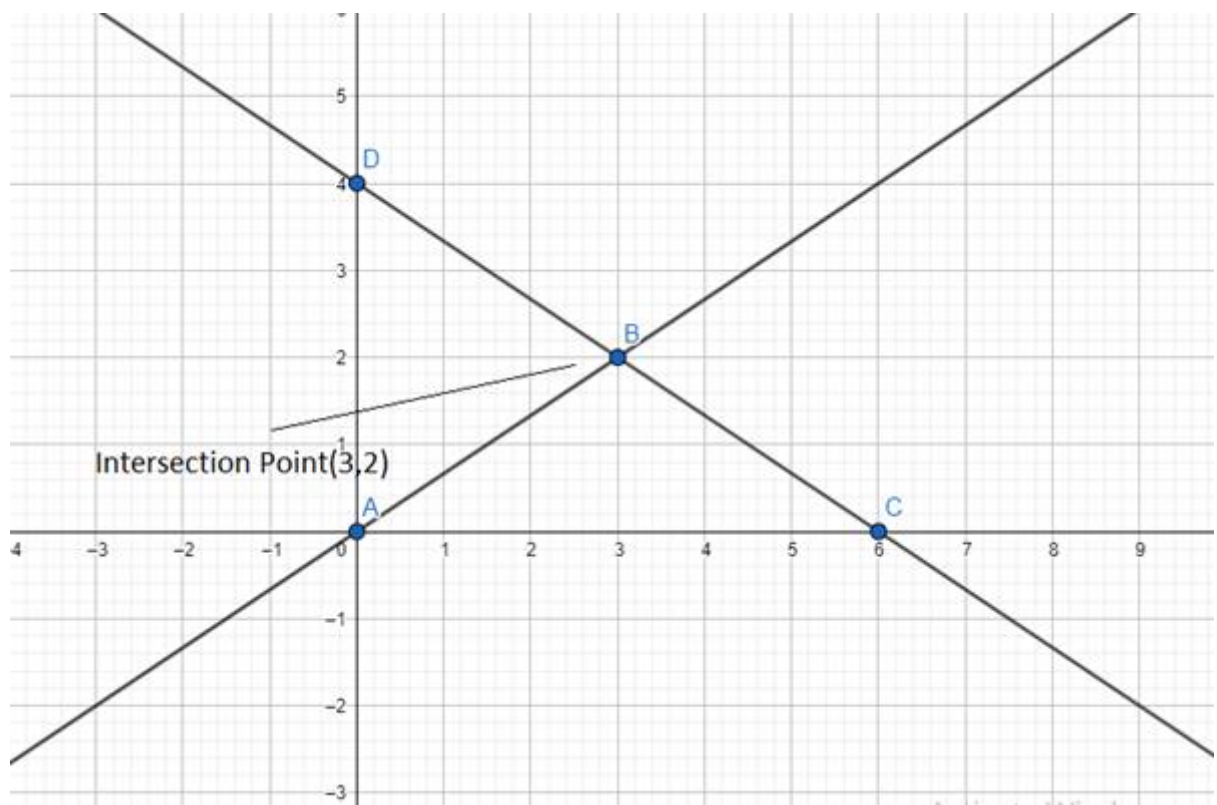
8 E. Question

Let us solve the following equations graphically.

5x – 2y = 1; 3x + 5y = 13

Answer

5x – 2y = 1

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	1	0
Y	2	- 1/2

3x + 5y = 13

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	1	0
Y	2	13/5

Intersection point (1,2)
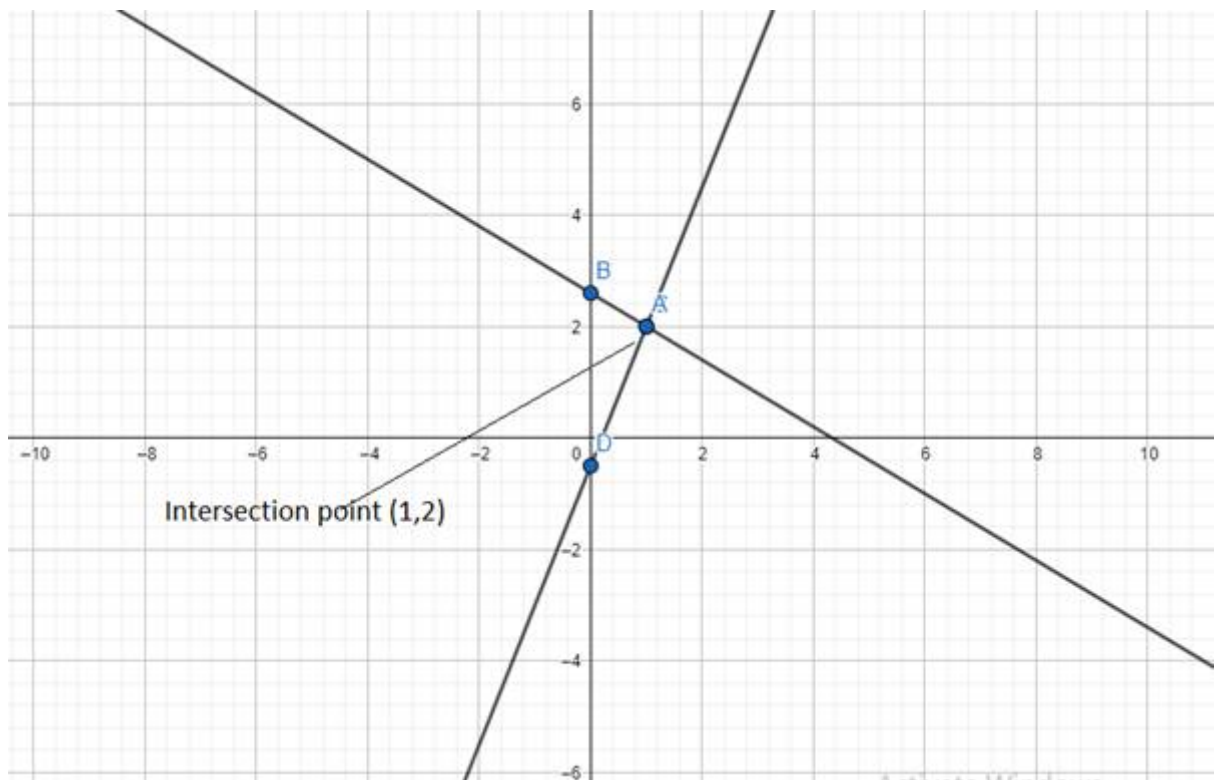
9. Question

Let us determine the solution of the given equation graphically.

3x + 2y = 12 = 9x – 2y

Answer

3x + 2y = 12 ......(1)

9x – 2y = 12 .....(2)

3x + 2y = 12

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	2	4
Y	3	0

9x – 2y = 12

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	2	0
Y	3	– 6

intersection Point(2,3)
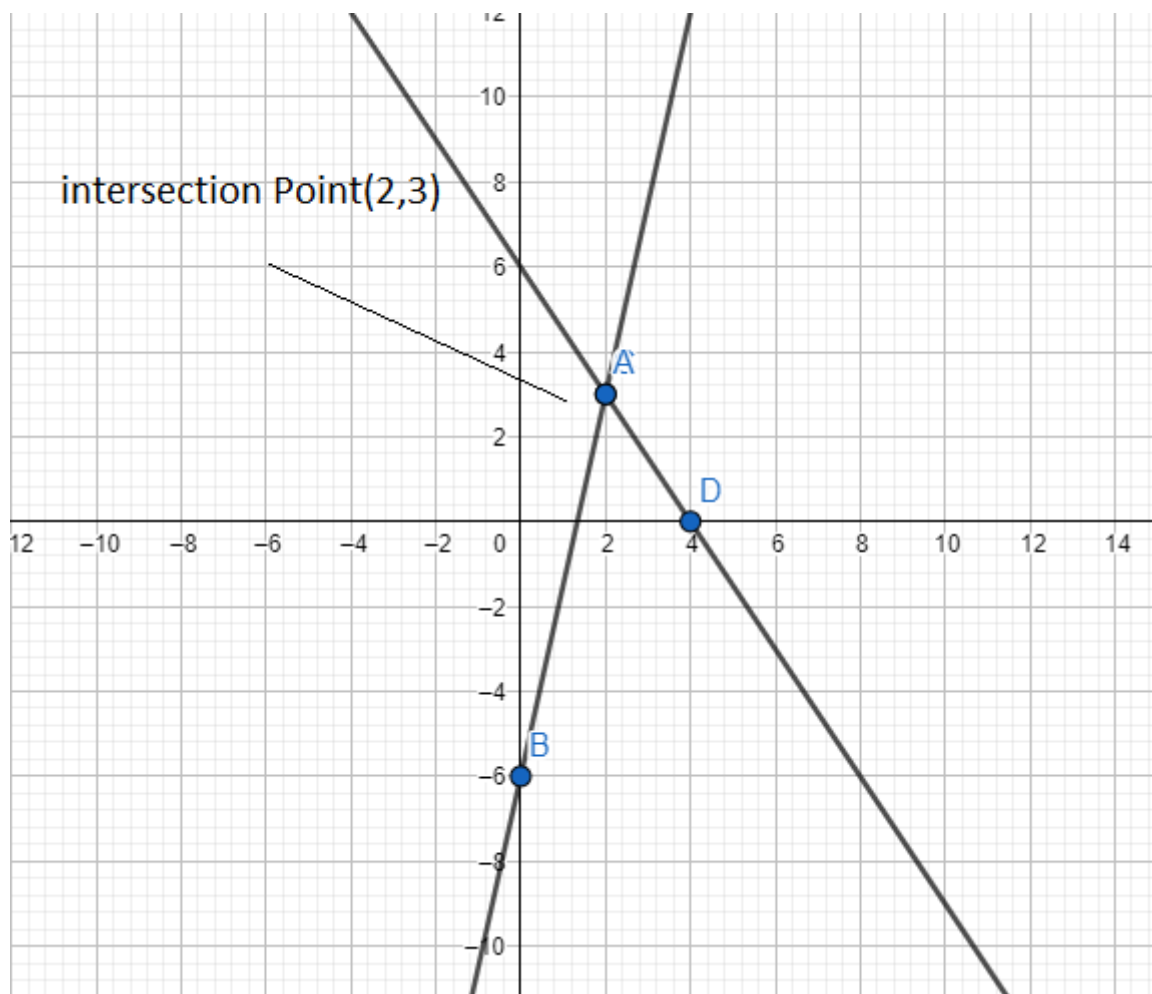
10. Question

Let us draw the graph of the equation $\dfrac{x}{3} + \dfrac{y}{4} = 2$ and calculate the area of the triangle formed by the graph and the axes and write the area.

Answer

$$\dfrac{x}{3} + \dfrac{y}{4} = 2$$

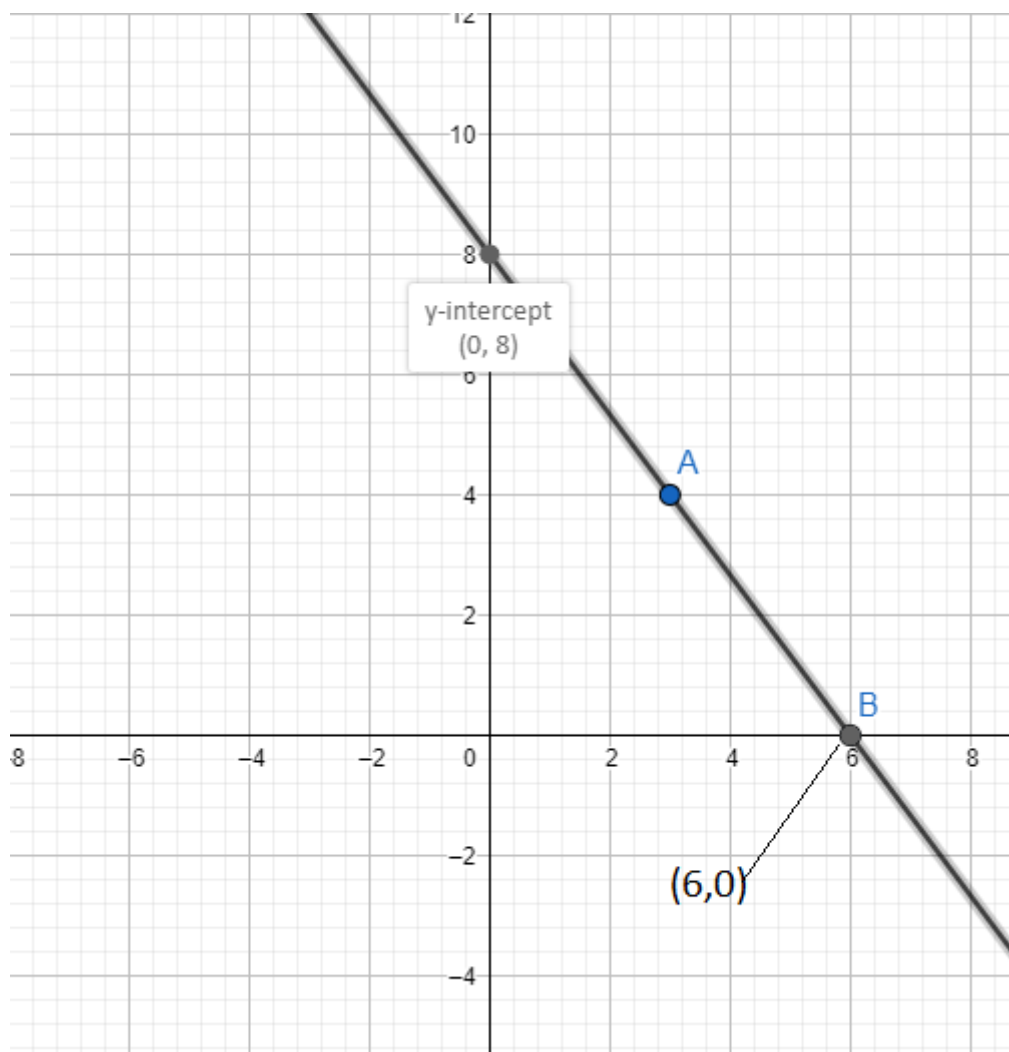To remove the denominators we need multiply the whole equation by LCM of denominators i.e.

4x + 3y = 24

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	C	D
X	3	6
Y	4	0

Vertices of the triangle formed by the graph and the Axis are (0,0), (0,8) and (6,0)

This is a Right angle triangle, Area of the Right Angle Triangle =
$\frac{1}{2} \times$ base $\times$ Height

As we can see in this Graph base is 6 units and Height is 8 units.

Area $= \frac{1}{2} \times 6 \times 8$

Area = 24 Unit^2

11. Question

Let us draw the graph of the three equations x = 4, y = 3 and 3x + 4y = 12 and determine the area of the triangle formed by the graph.

Answer

0.y + 1.x = 4

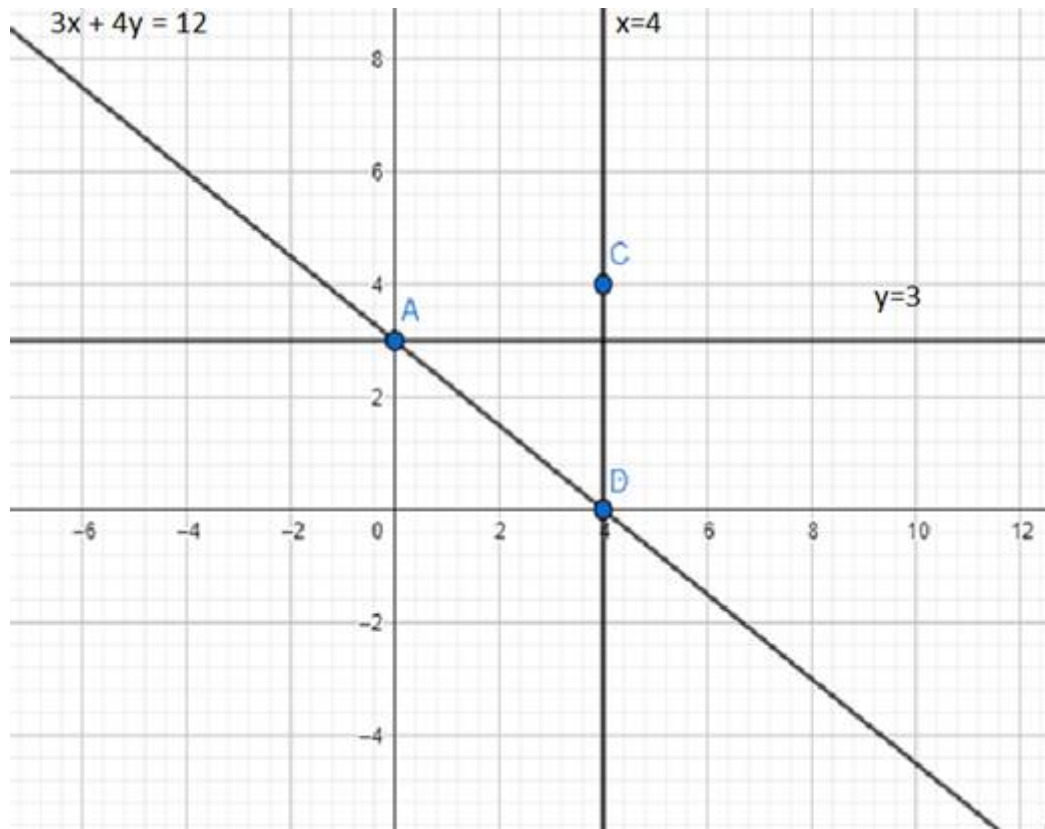Y could be anything because coefficient of y is zero. X has to be 4.

X	4	4
Y	4	0

Similarly for y = 3

X	1	3
Y	3	3

3x + 4y = 12

X	0	4
Y	3	0

As we can see here The Triangle is Right angle triangle So we need base and Height.

Base = 4 units, Height = 3 units

Area $= \frac{1}{2} \times 4 \times 3$

Area = 6 unit^2

12. Question

Let us draw the graph of the equation $y = \dfrac{x+2}{3}$. From the graph let's determine the value of y where x = −2 and the value of x where y = 3.
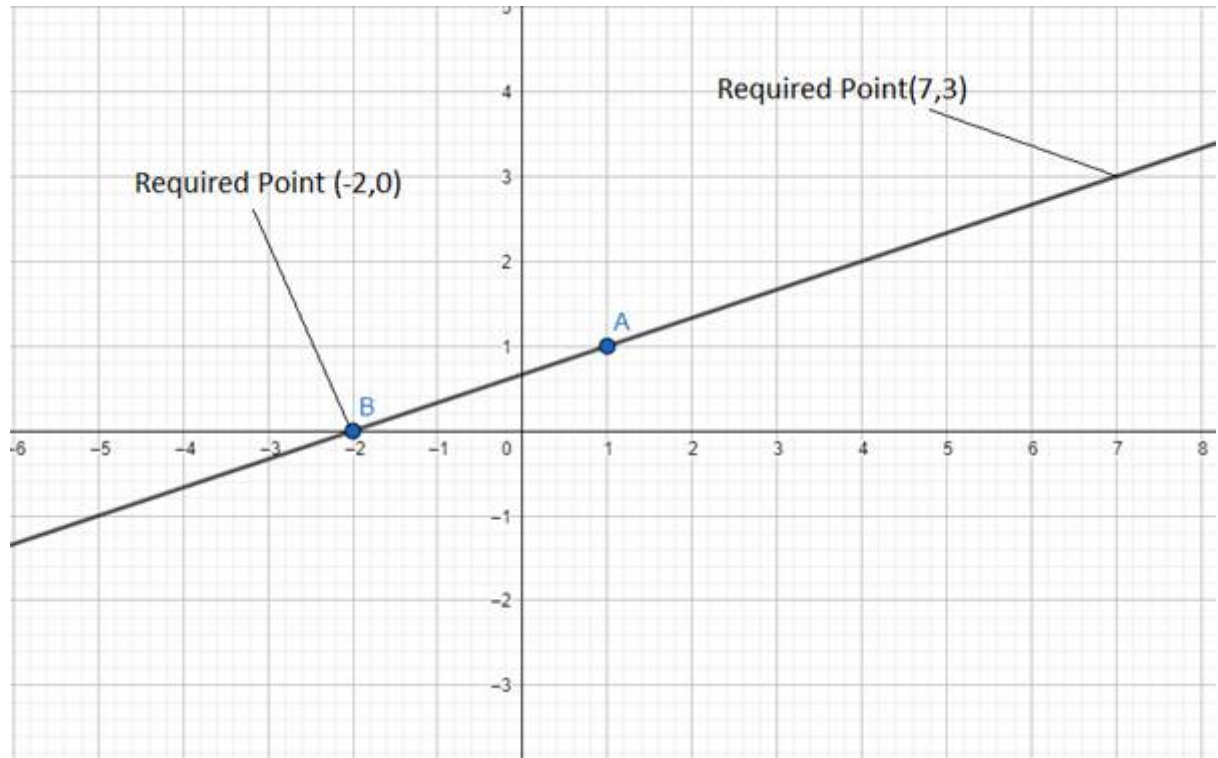
Answer

$y = \dfrac{x+2}{3}$.

3y = x + 2

3y – x = 2

	A	B
X	1	- 2
Y	1	0

13. Question

Let us solve graphically:

$$\frac{3x-1}{2} = \frac{2x+6}{3}$$

Answer

Let us determine the point of intersection by drawing the graph of the

equations $y = \dfrac{3x-1}{2}$ and $y = \dfrac{2x+6}{3}$.

The x co - ordinate of the point of intersection will be the required solution.

$y = \dfrac{3x-1}{2}$ ....(1)

$y = \dfrac{2x+6}{3}$ ....(2)

Solving Equation (1)

2y = 3x - 1

2y - 3x = - 1

	A	B
X	1	- 1
Y	1	- 2

Solving Equation (2)

3y = 2x + 6

3y - 2x = 6

	C	D
X	0	- 3
Y	2	0
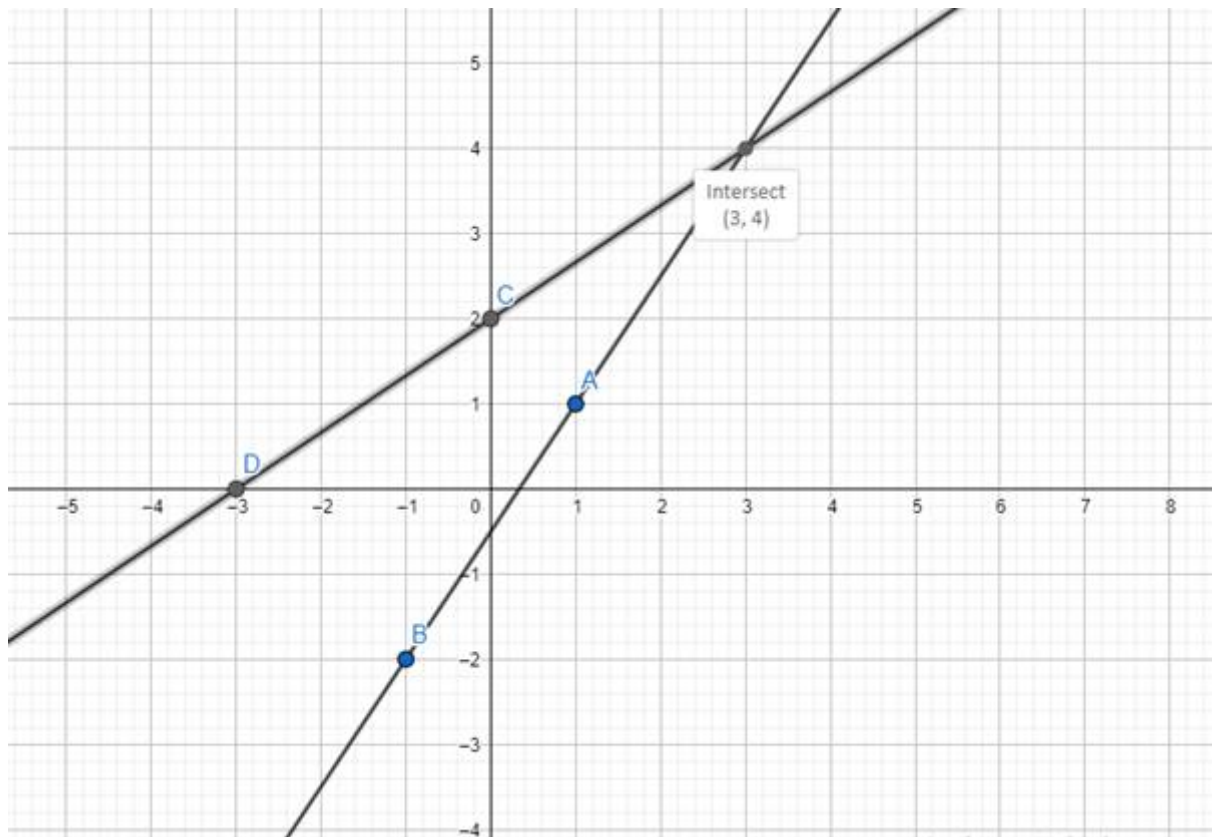
The X coordinate of the intersection point is 3

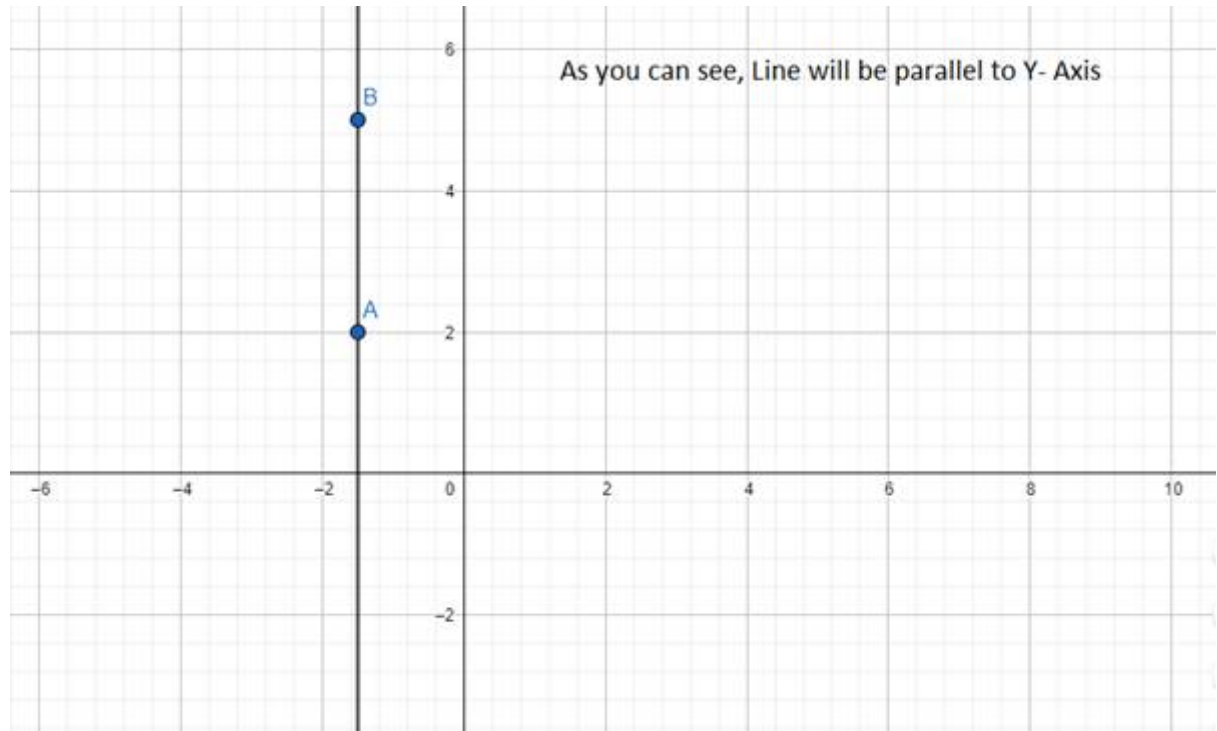**14 A. Question**

The graph of the equation 2x + 3 = 0 is

A. parallel to x - axis

B. parallel to y - axis

C. not parallel to any axis

D. passing through origin

Answer

2x + 3 = 0

Coefficient of y is 0 so it will not depend on y

	A	B
X	- 3/2	- 3/2
Y	2	5

As you can see, Line will be parallel to Y- Axis

14 B. Question

The graph of the equation ay + b = 0 (a & b are constants and a ≠ 0, b ≠ 0) is

A. parallel to x - axis

B. parallel to y - axis

C. not parallel to any axis

D. passing through origin

Answer

ay + b = 0

Here,

$$y = -\frac{b}{a}$$

Now, y is a constant here, i.e. x is independent therefore we will get a line parallel to x axis.

14 C. Question
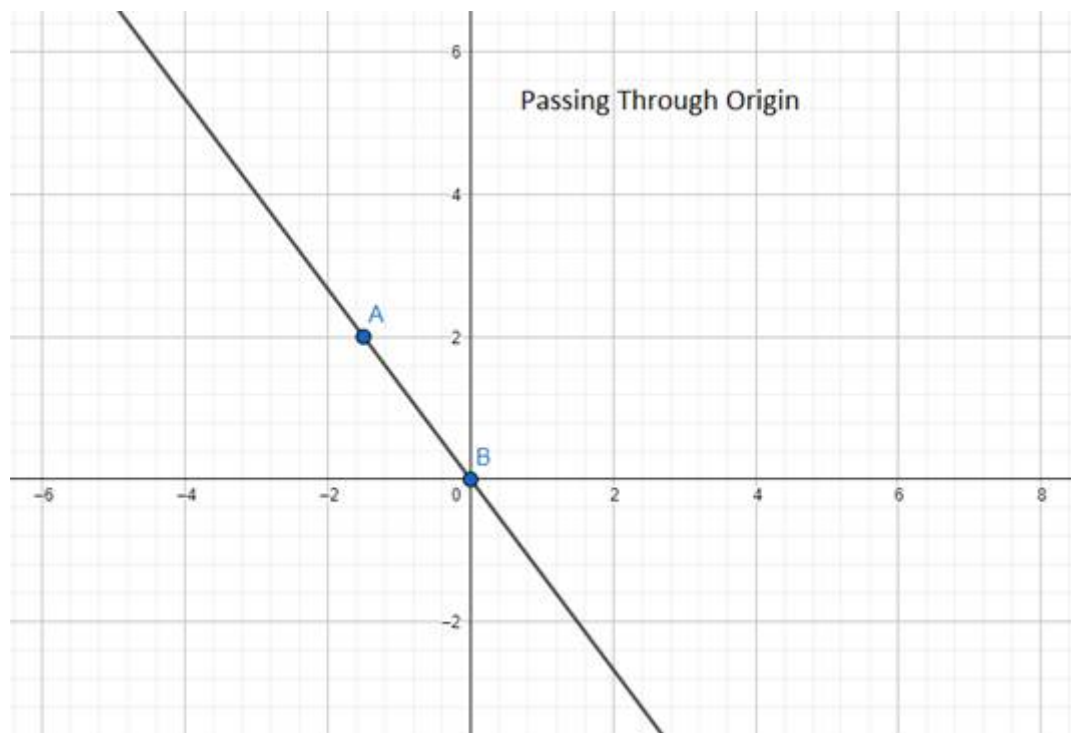
The graph of the equation 2x + 3y = 0 is

A. parallel to x - axis

B. parallel to y - axis

C. passing through origin

D. passing through (2, 0)

Answer

2x + 3y = 0

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	A	B
X	- 3/2	0
Y	1	0

We can see from the graph that line is passing through origin!

14 D. Question

The graph of the equation cx + d = 0 (c & d are constants and c ≠ 0) will be y - axis, when

A. d = −c

B. d = c

C. d = 0

D. d = 1

Answer

cx + d = 0

As the equation of y - axis is x = 0

$\Rightarrow$ c(0) + d = 0

$\Rightarrow$ d = 0

14 E. Question

The graph of the equation ay + b = 0 (a & d are constants and a $\neq$ 0) will be x - axis, when

A. b = a

B. b = –a

C. b = 2

D. b = 0

Answer

ay + b = 0

As the equation of x - axis is y = 0

$\Rightarrow$ a(0) + b = 0

$\Rightarrow$ b = 0

15 A. Question

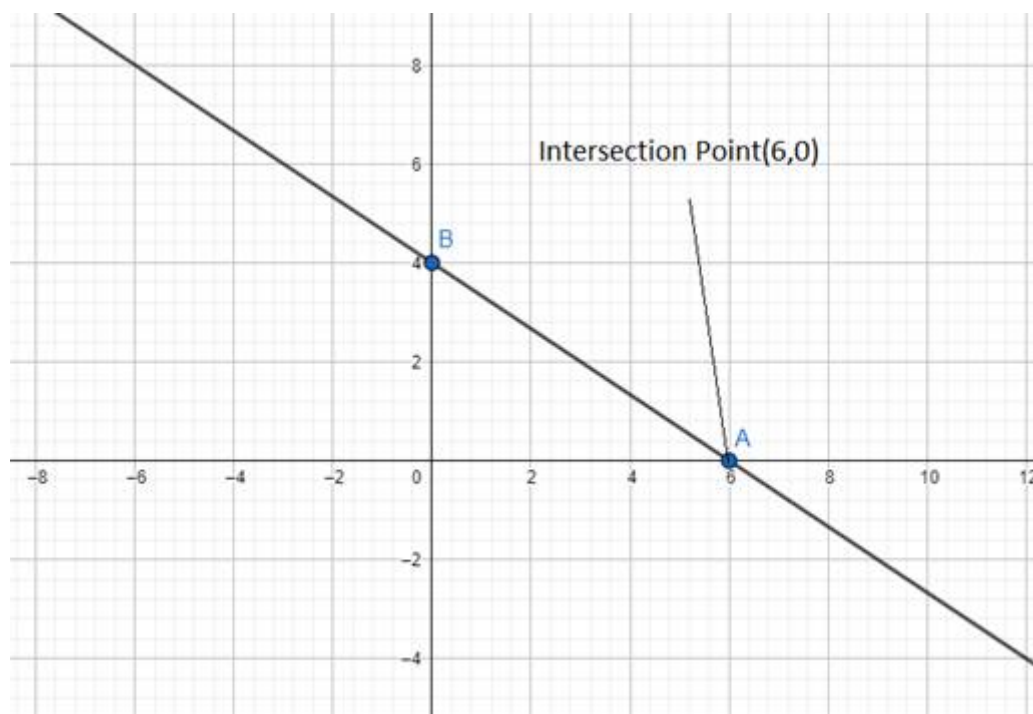Let us write the co - ordinates of the point of intersection of the graph of the equation

2x + 3y = 12 and the x - axis.

Answer

2x + 3y = 12

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	B	A
X	6	0
Y	0	4

From the graph, we can see that the line and x axis intersect at (6, 0)

15 B. Question

Let us write the co - ordinates of the point of intersection of the graph of the equation
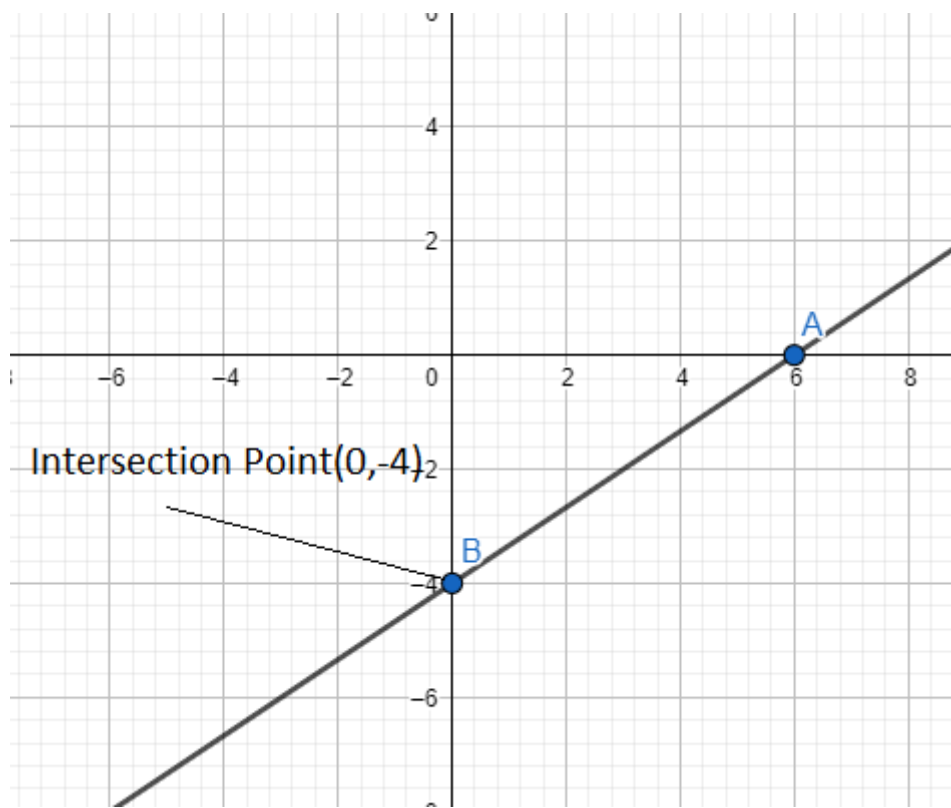
2x – 3y = 12 and the y - axis.

Answer

2x – 3y = 12

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	B	A
X	6	0
Y	0	- 4

Intersection Point(0,-4)

From the graph, we can see that the line and x axis intersect at (6, 0)
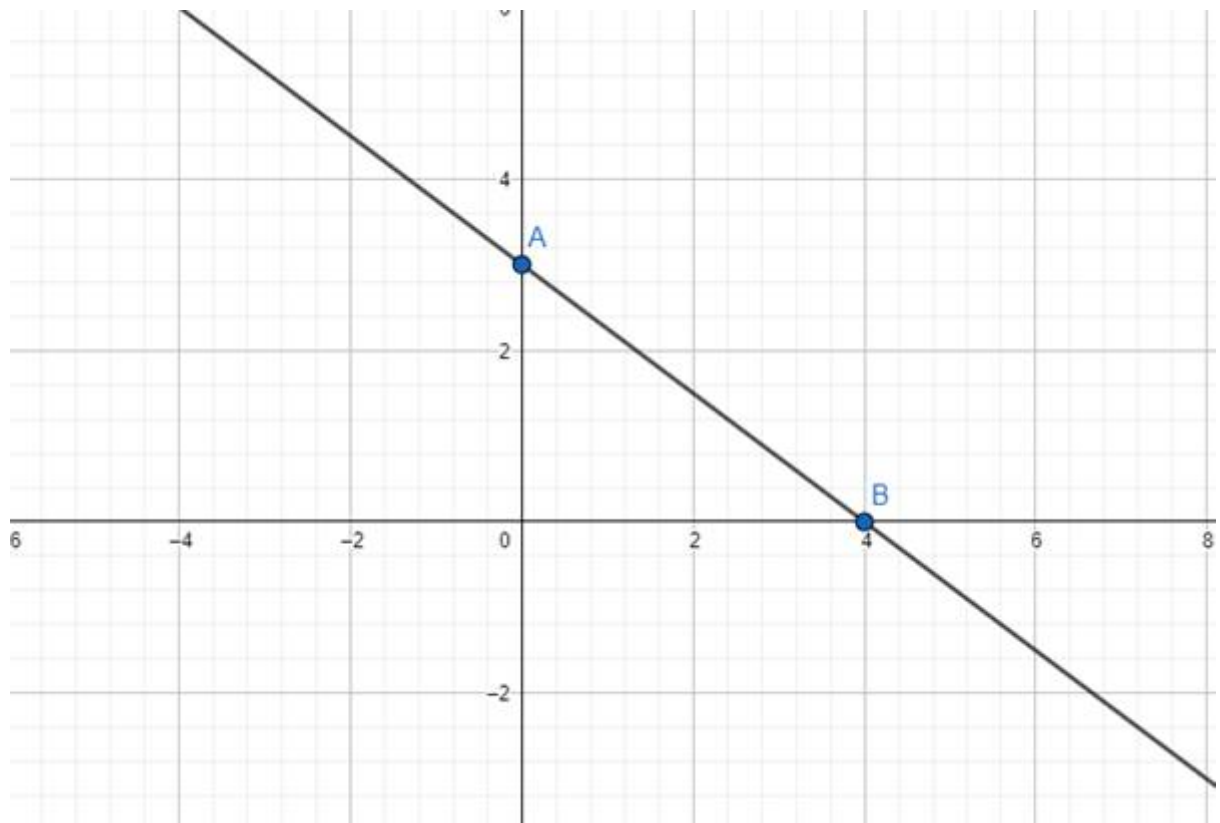
15 C. Question

Let us write the area of the triangle formed by the graph of the equation $3x + 4y = 12$ and the axes.

Answer

$3x + 4y = 12$

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	B	A
X	4	0
Y	0	3

Vertices of the triangle formed by the graph and the Axis are (0,0), (0,3) and (4,0)

This is a Right angle triangle, Area of the Right Angle Triangle = $\frac{1}{2} \times$ base $\times$ Height

As we can see in this Graph base is 4 units and Height is 3 units.
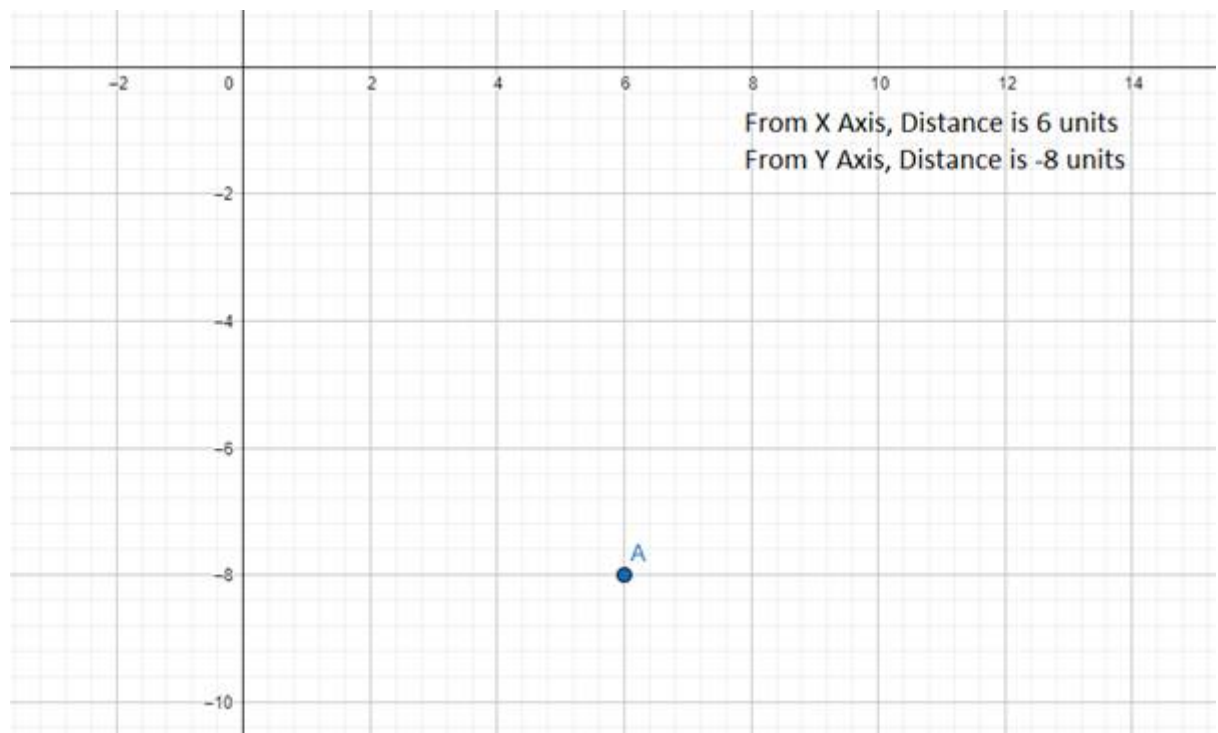
Area $= \frac{1}{2} \times 4 \times 3$

Area = 6 Unit^2

15 D. Question

Let us write the distances of the point (6, –8) from x - axis and y - axis.

Answer

We plot (6, - 8) in the graph and see the distances!

From X Axis, Distance is 6 units
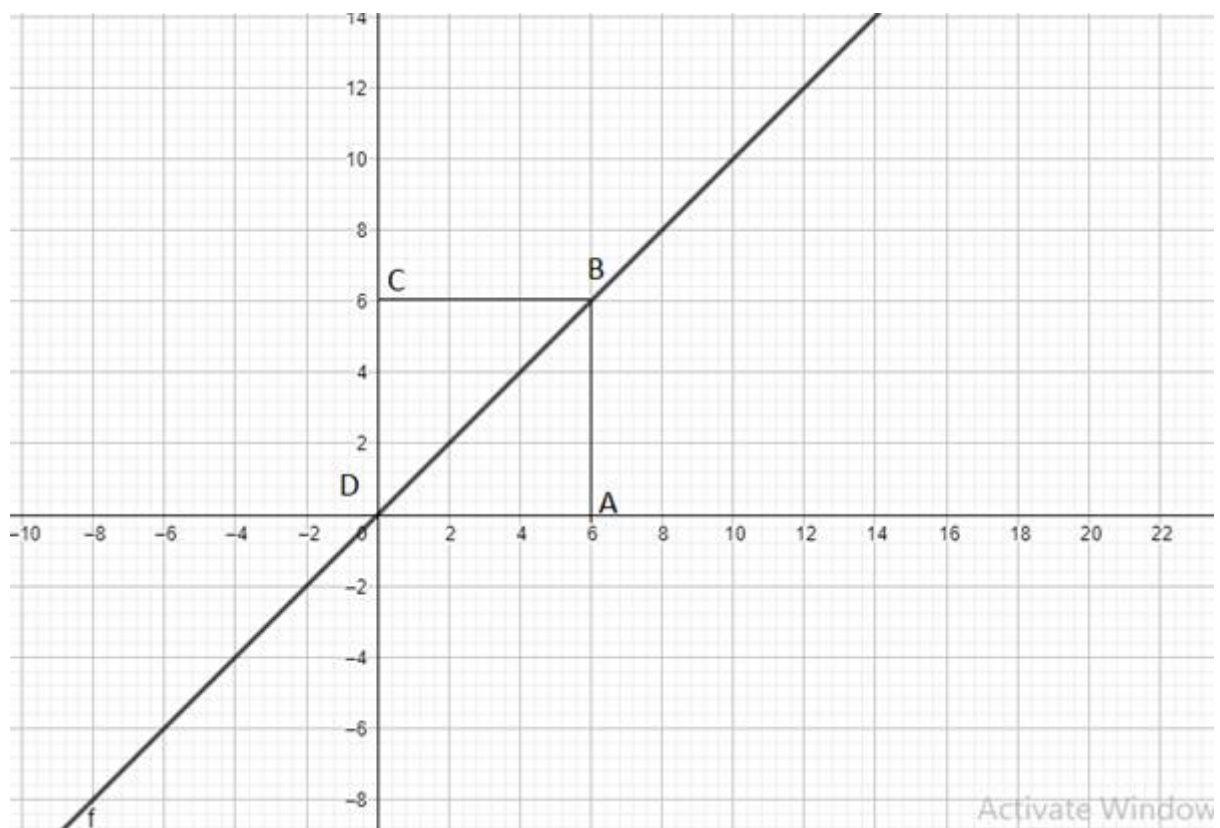From Y Axis, Distance is -8 units

15 E. Question

Let us write the angle derived from the equation x = y in the positive direction of x - axis.

Answer

x = y

Putting different values of x, we get different values of 'y', hence we get points for plotting as:

	D	B
X	0	3
Y	0	3

Now we need to find the angle line derived from line y = x in the positive direction of x - axis i.e. ∠ADB

From the graph, clearly ABD is a right - angled triangle, therefore

∴ ∠DAB = 90°

And

AD = AB

∠ABD = ∠ADB [angles opposite to equal sides are equal]

Also, In ΔABC By angle sum property of triangle

∠DAB + ∠ABD + ∠ADB = 180°

⇒ 90° + ∠ABD + ∠ABD = 180°

⇒ 2∠ABD = 90°

⇒ ∠ABD = 45°