➤ **Choose the right answer from the given options. [1 Marks Each]** **[10]**

1. The graph of the linear equation y = 3x passes through the point.

(A) $(0, -\frac{2}{3})$ (B) $(\frac{2}{3}, 2)$ (C) $(, -\frac{2}{3}, 0)$ (D) $(0, \frac{2}{3})$

Ans. :

b. $(\frac{2}{3}, 2)$

Solution:

$y = 3x$

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

For $x = \frac{2}{3}$, the value of $y = 3 \times \frac{2}{3} = 2$

So $(\frac{2}{3}, 2)$.

2. Any solution of the linear equation 2x + 0y + 9 = 0 in two variables is of the form:

(A) $\left(0, -\frac{9}{2}\right)$ (B) $(-9, 0)$ (C) $\left(n, -\frac{9}{2}\right)$ (D) $\left(-\frac{9}{2}, m\right)$

Ans. :

d. $\left(-\frac{9}{2}, m\right)$

Solution:

2x + 9 = 0

$\Rightarrow x = \frac{-9}{2}$ And y = m, where m is any real number,

Hence, $\left(-\frac{9}{2}, m\right)$ is the solution of the given equation.

3. Find the value of k, if x = 1, y = 2 is a solution of the equation 2x + 3y = k.

(A) 5 (B) 6 (C) 7 (D) 8

Ans. :

d. 8

4. If the point (3, 4) lies on the graph of 3y = ax + 6, then the value of 'a' is:

(A) 2 (B) 0 (C) 3 (D) 1

Ans. :

a. 2

Solution:

The point (3, 4) lies on the graph of 3y = ax + 6

So it will satisfy the equation

3y = ax + 6

3(y) = ax + 6

12 = 3a + 6

12 - 6 = 3a

3a = 6

$a = \frac{6}{3}$

a = 2

5. Write the correct answer in the following: The graph of the linear equation 2x + 3y = 6 cuts the Y-axis at the point,

(A) (2, 0) (B) (0, 3) (C) (3, 0) (D) (0, 2)

Ans. :

d. (0, 2)

Solution:

The graph of the linear equation 2x + 3y = 6 cuts the y-axis at the point where x coordinate is zero.

Putting x = 0 in 2x + 3y = 6, we get

2(0) + 3y = 6 ⇒ 3y = 6 ⇒ y = 6 ÷ 3 = 2

6. The equation x = 7 in two variables can be written as:

(A) 1.x + 1.y = 7 (B) 1.x + 0.y = 7 (C) 0.x + 1.y = 7 (D) 0.x + 0.y = 7

Ans. :

b. 1.x + 0.y = 7

Solution:

The equation x = 7 in two variables can be written as exactly 1.x + 0.y = 7

because it contain two variable x and y and coefficient of y is zero as there is no term containing yin equation x = 7

7. If a linear equation has solutions (1, 2), (-1, -16) and (0, -7), then it is of the form:

(A) y = 9x - 7 (B) 9x - y + 7 = 0 (C) x - 9y = 7 (D) x = 9y - 7

Ans. :

a. y = 9x - 7

Solution:

Since all the given co- ordinate (1, 2), (-1, -16) and (0, -7) satisfy the given line y = 9x - 7

For point (1, 2)

y = 9x - 7

2 = 9(1) - 7

2 = 9 - 7

2 = 2

Hence (2, 1) is a solution.

For point (-1, -16)

y = 9x - 7

-16 = 9(-1) - 7

-16 = -9 - 7

-16 = -16

Hence (-1, -16) is a solution.

For point (0, -7)

y = 9x - 7

-7 = 9(0) -7

-7 = -7

Hence (0, -7) is a solution.

8. Which of the following is a linear equation in two variables?

(A) x + 5 = 8 (B) 2x - 5y = 0 (C) x^2= 5x + 3 (D) 5x = y^2+ 3

Ans. :

b. 2x - 5y = 0

Solution:

In linear equation power of variable x and y should be 1 and here, the given linear equation has two variable x and y.

9. If (2, 0) is a solution of the linear equation 2x + 3y = k, then the value of k is:

(A) 2 (B) 4 (C) 5 (D) 6

Ans. :

b. 4

Solution:

Substitute x = 2 and y = 0 in the given equation, we get

2 (2) + 3 (0) = k

k = 4 + 0

k = 4.

Hence, the value of k is 4.

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10. Express y in terms of x in the equation 5x - 2y = 7.

(A) $y = \frac{5x+7}{2}$ (B) $y = \frac{7x+5}{2}$ (C) $y = \frac{5x-7}{2}$ (D) $y = \frac{7-5x}{2}$

Ans. :

c. $y = \frac{5x-7}{2}$

Solution:

5x - 2y = 7

-2y = 7 - 5x

2y = 5x - 7

$y = \frac{5x-7}{2}$.

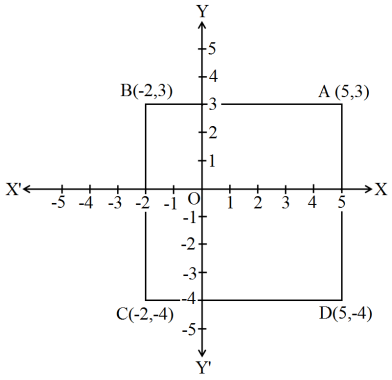
➤ **Answer the following short questions. [2 Marks Each]** **[8]**

11. In which quadrant or on which axis each of the following points lie?
(-3, 5), (4, -1), (2, 0), (2, 2), (-3, -6)

Ans. : In point (-3, 5), x-coordinate is negative and y-coordinate is positive, so it lies in II quadrant. In point (4, -1), x-coordinate is positive and y-coordinate is negative, so it lies in IV quadrant. In point (2, 0), x-coordinate is positive and y-coordinate is zero, so it lies on X-axis. In point (2, 2), x-coordinate and y-coordinate both are positive, so its lies in I quadrant. In point (-3, -6), x-coordinate and y-coordinate both are negative, so its lies in III quadrant.

12. Points A(5, 3), B(-2, 3) and D(5, -4) are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of the vertex C.

Ans. : The graph obtained by plotting the points A, B and C and D is given below. Take a point C on the graph such that ABCD is a square i.e., all sides AB, BC, CD, and AD are equal. So, abscissa of C should be equal to abscissa of B i.e., -2 and ordinate of C should be equal to ordinate of D i.e., -4. Hence, the coordinates of C

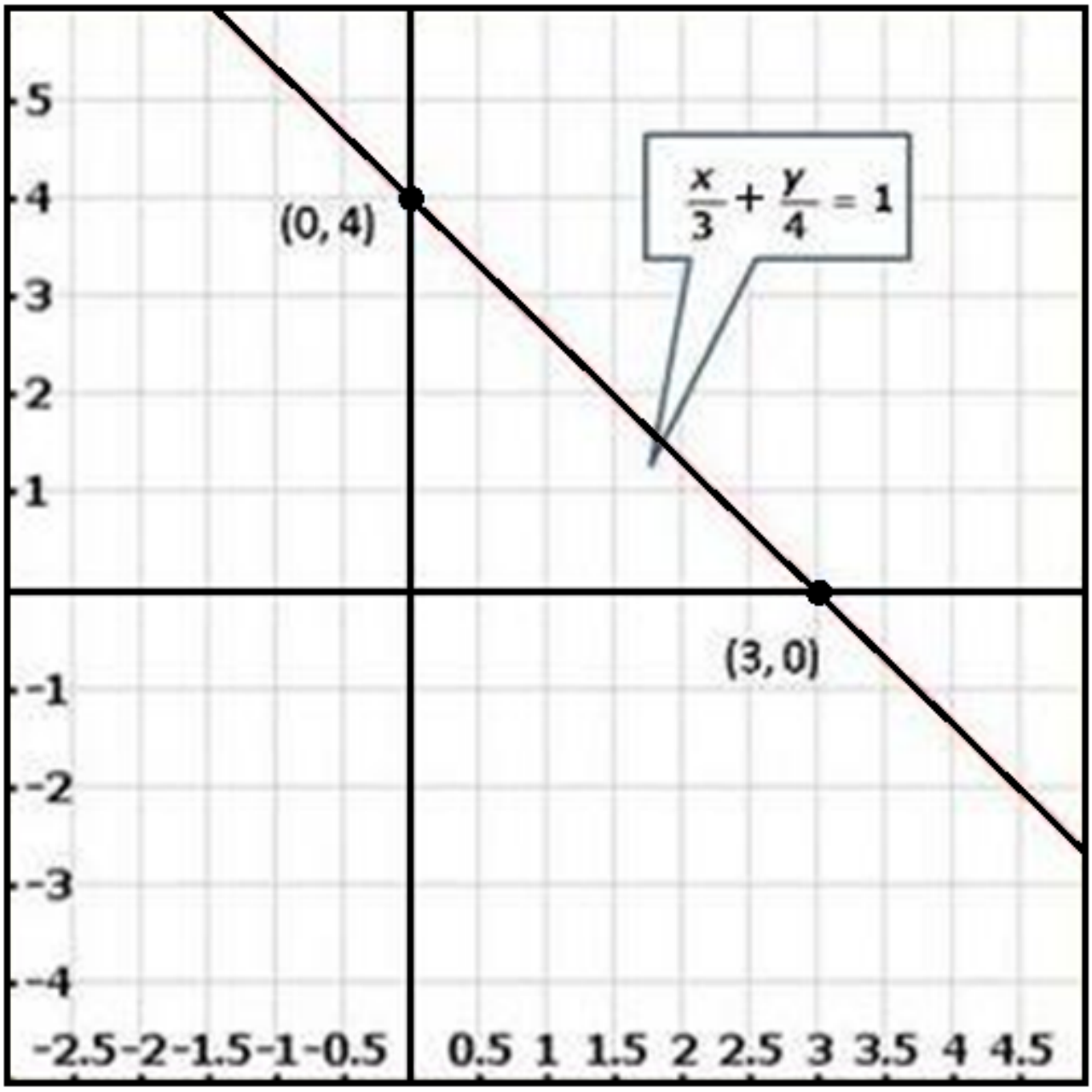


are (-2, -4).

13. Draw the graph of the equation $\frac{x}{3}+\frac{y}{4}=1$. Also, find the area of the triangle formed by the line and the coordinates axes.

Ans. : We are given, $\frac{x}{3}+\frac{y}{4}=1$ 4x + 3y = 12 We get, $y=\frac{12-4x}{3}$ Now, Substituting x = 0 in $y=\frac{12-4x}{3}$, we get y = 4 Substituting x = 3 in $y=\frac{12-4x}{3}$, we get Thus, we have the following table exhibiting the abscissa and ordinates of points on the line represented by the given equation

x	0	3
y	4	0



The region bounded by the graph is ABC which form a traingle.
AC at y axis is the base of traingle having AC = 4 units on y axis.
BC at x axis is the height of traingle having BC = 3 units on x axis.
Therefore,
Area of traingle ABC, say A is given by

$\mathrm{A} = \frac{1}{2}(\mathrm{Base} \times \mathrm{Height})$

$\mathrm{A} = \frac{1}{2}(\mathrm{AC} \times \mathrm{BC})$

$\mathrm{A} = \frac{1}{2}(4 \times 3)$

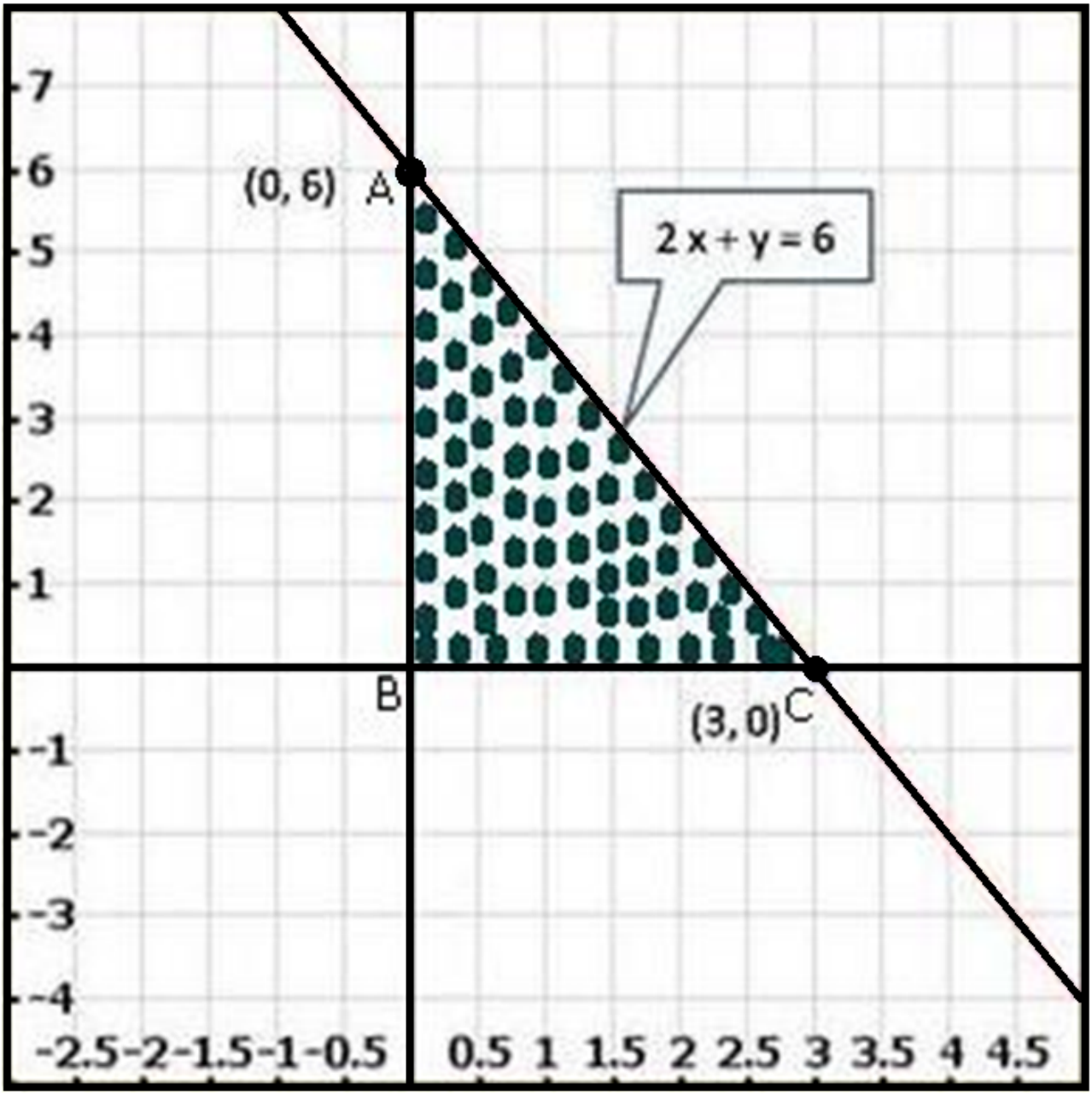
$(\mathrm{AC} \times \mathrm{BC})\mathrm{A} = 6\mathrm{sq.\ units}$

14. Draw the graph of the equation 2x + y = 6. Shade the region bounded by the graph and the coordinate axes. Also, find the area of the shaded region.

Ans. : We have, 2x + y = 6 ⇒ y = 6 - 2x ...(i) Putting x = 3 in (i), we get y = 6 - 2 × 3 = 0 Putting x = 0 in (i), we get y = 6 - 2 × 0 = 6 Thus, we obtain the following table giving coordinates of two points on the line represented by the equation 2x + y = 6.

X	3	0
y	0	6

The graph of line 2x + y = 6:



The area enclosed by the graph of line and the coordinate axes is shaded in the graph Now, Required area = Area of the shaded region ⇒ Required area = Area of $\triangle ABC$ ⇒ Required area $= \frac{1}{2}(\text{Base} \times \text{Height})$ ⇒ Required area $= \frac{1}{2}(3 \times 6)$ =9sq. units.

➤ **Answer the following questions. [3 Marks Each]** **[12]**

15. Ravish tells his doughter Aarushi, "Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be".. If present ages of Aarushi and Ravish are x and y years respectively, represent this situation algebraically as well as graphically.

Ans. :

It is given that seven year ago Ravish was seven times as old as his daughter.
x = Daughter, y = Father
∴ 7(x - 7) = y - 7
⇒ 7x - 49 = y - 7
⇒ 7x - 42 = y ...(i)
It is also given that after three years from now Ravish shall be three times as old as her daughter.
3(x + 3) = y + 3
⇒ 3x + 9 = y + 3
⇒ 3x + 6 = y ...(ii)

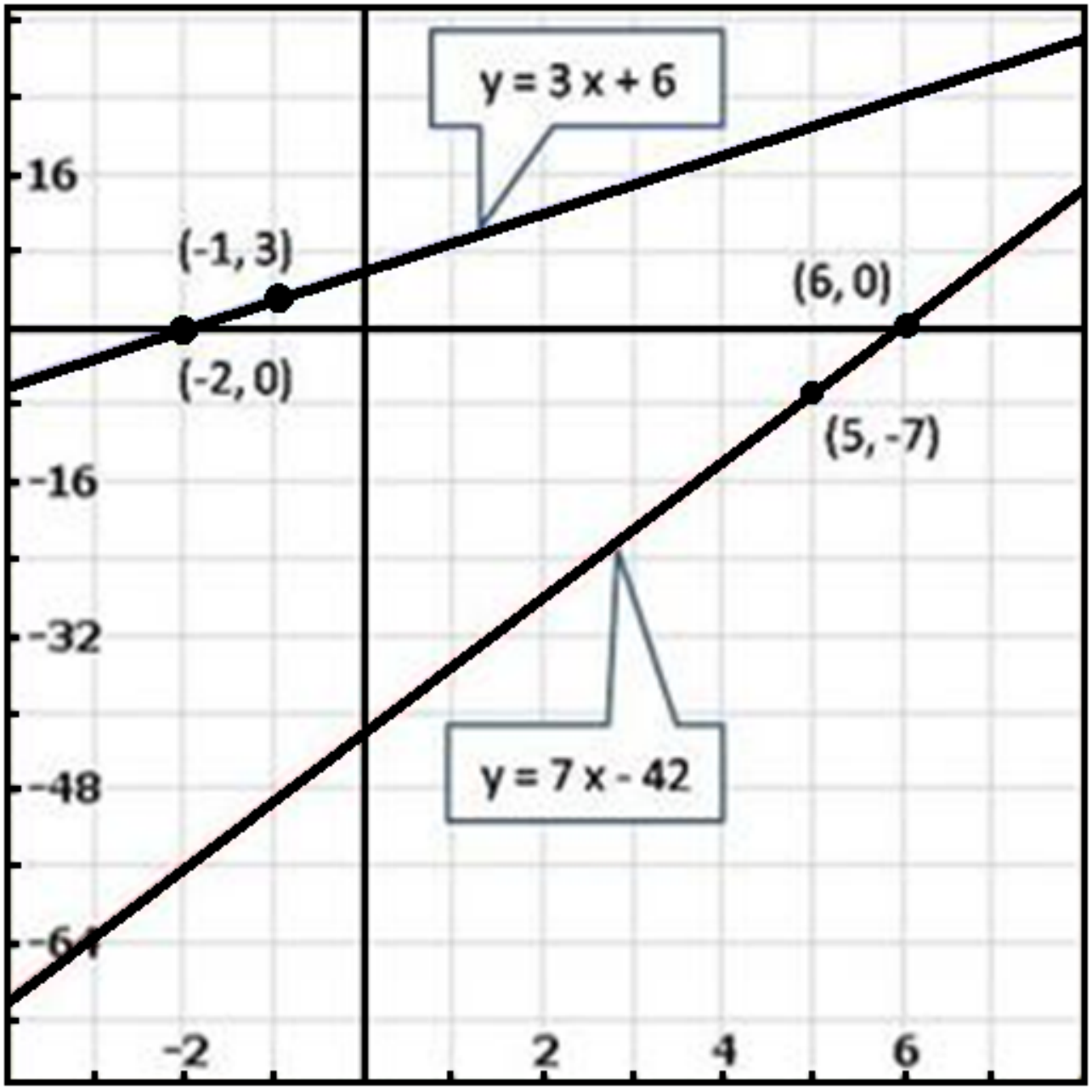
Now,
y = 7x - 42 [Using (i)]
Putting x = 6, we get y = 7 × 6 - 42 = 0
Putting x = 5, we get y = 7 × 5 - 42 = -7
Thus, we have the following table for the points on the line 7x - 42 = y:

x	6	5
y	0	-7

We have,
y = 3x + 6 [Using (ii)]
Putting x = -2, we get y = 3 × (-2) + 6 = 0
Putting x = -1, we get y = 3 × (-1) + 6 = 3
Thus, we have the following table for the points on the line y = 3x + 6:

x	-1	-2
y	3	0

The graphs of the both linear equations are:



16. Aarushi was driving a car with uniform speed of 60km/ h. Draw distance-time graph. From the graph, find the distance travelled by Aarushi in:
    i. $2\frac{1}{2}$ Hours
    ii. $\frac{1}{2}$ Hour

Ans. :
Let x be the fime and y be the distance travelled by Aarushi.
It is given that speed of car is 60km/ h
We know that,

$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

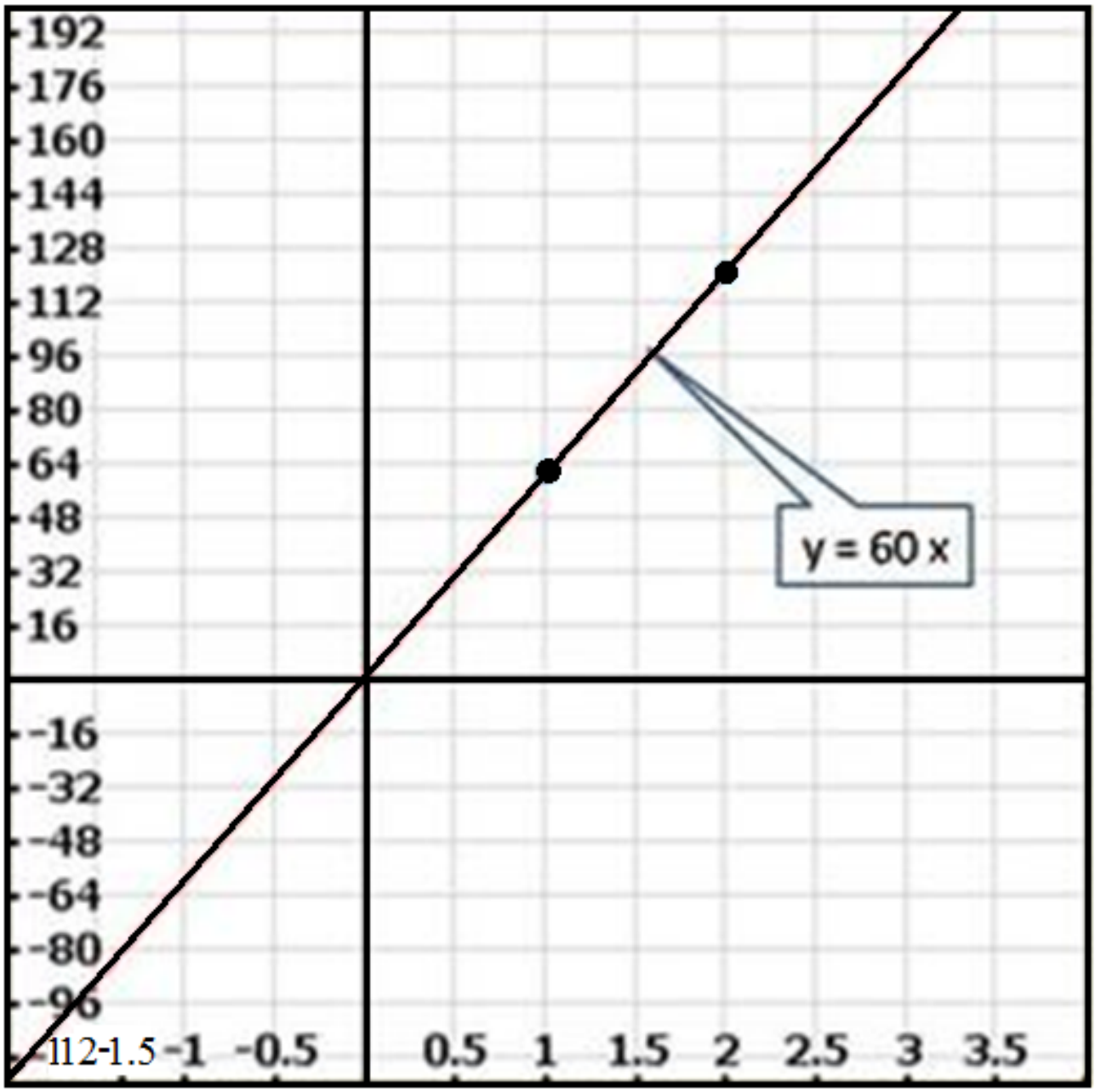
$\Rightarrow 60 = \frac{y}{x}$

$\Rightarrow y = 60x$

Putting x = 1, we get y = 60
Putting x = 2, we get y = 120
Thus, we have the following table for the points on the line y = 60x:

x	1	2
y	60	120

The graph of the equation y = 60x :



i. To find the coordinates of the point when $x = 2\frac{1}{2} = 2.5,$ we draw a line parallel to y-axis and passing through (2.5, 0). This line meets the graph of y = 60x at a point P from which we draw a line parallel to x-axis which crosses y-axis at y = 150. So, the distance traveled by Aarushi in $2\frac{1}{2}$ hours is 150km.

ii. To find the coordinates of the point when $x = \frac{1}{2} = 0.5,$ we draw a line parallel to y-axis and passing through (0.5, 0). This line meets the graph of y = 60x at a point P from which we draw a line parallel to

x-axis which crosses y-axis at y = 30. So, the distance travelled by Aanushi in $\frac{1}{2}$ hour is 30km.

17. Draw the graphs of the linear equations 4x - 3y + 4 = 0 and 4x + 3y - 20 = 0. Find the area bounded by these lines and x-axis.

Ans. :

We have,

4x - 3y + 4 = 0

⇒ 4x = 3y - 4

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

Putting y = 0, we get $x = \frac{3\times 0-4}{4} = -1$

Putting y = 4, we get $x = \frac{3\times 4-4}{4} = 2$

Thus, we have the following table for the points on the line 4x - 3y + 4 = 0:

x	-1	2
y	0	4

We have,

4x - 3y - 20 = 0

⇒ 4x = 20 - 3y

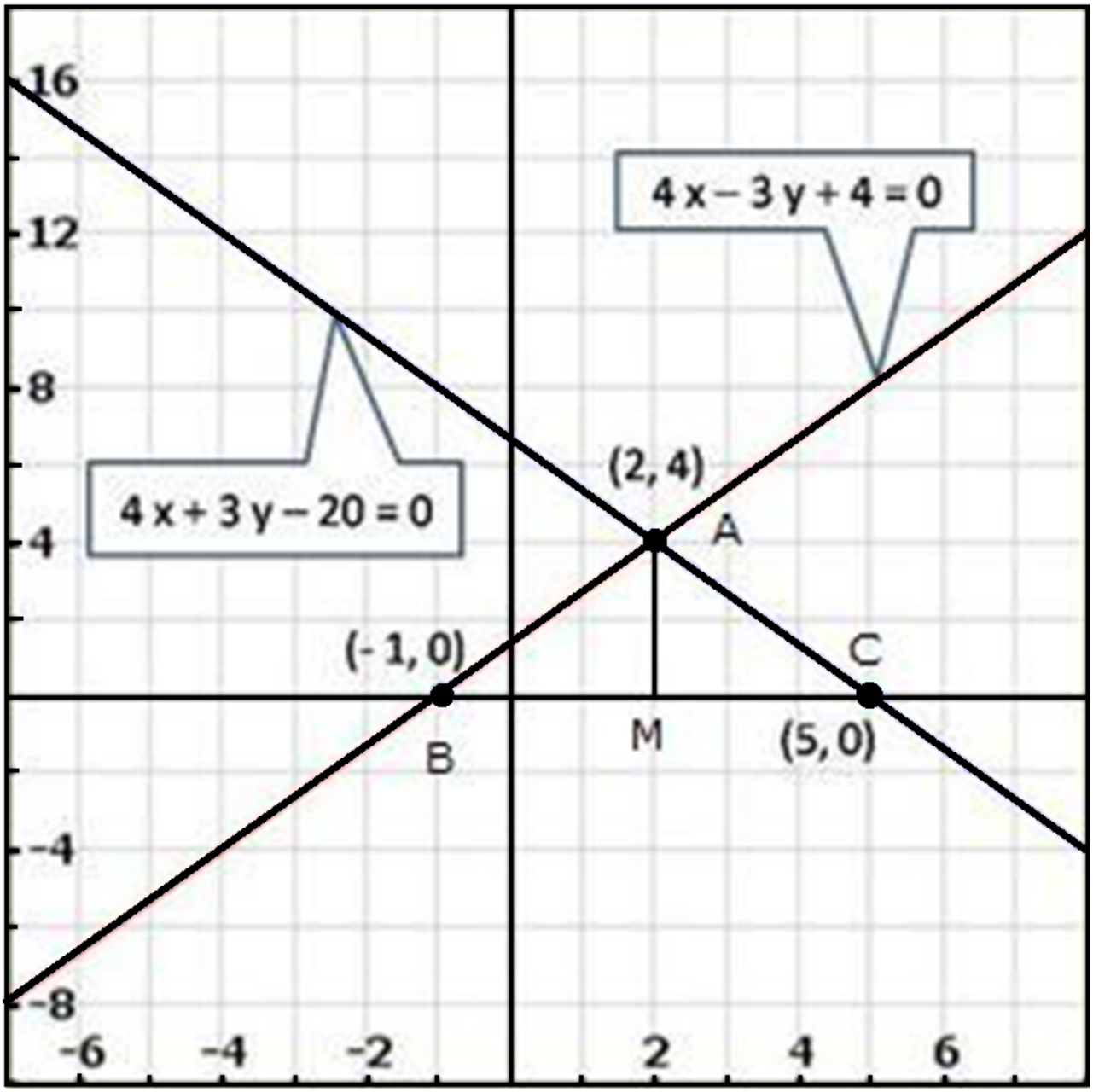
$\Rightarrow x = \frac{20-3y}{4}$

Putting y = 0, we get $x = \frac{20-3\times 0}{4} = 5$

Putting y = 4, we get $x = \frac{20-3\times 4}{4} = 2$

Thus, we have the following table for the points on the line 4x - 3y - 20 = 0:

x	5	2
y	0	4



Clearly, two lines intersect atA(2, 4).
The graph of line 4x - 3y + 4 = 0 and 4x - 3y - 20 = 0 intersect with y-axis at B(-1, 0) and C(5, 0) respectively.
So, the vertices of the triangle formed by the two straight lines and y-axis are A(3, 2), B(0, 4) and C(0, -1).

$\therefore \text{Area of } \triangle ABC = \frac{1}{2}(\text{Base} \times \text{Height})$

$= \frac{1}{2}(BC \times AM)$

$= \frac{1}{2}(6 \times 4)$

$= 3 \times 4$

$= 12\text{sq.units.}$

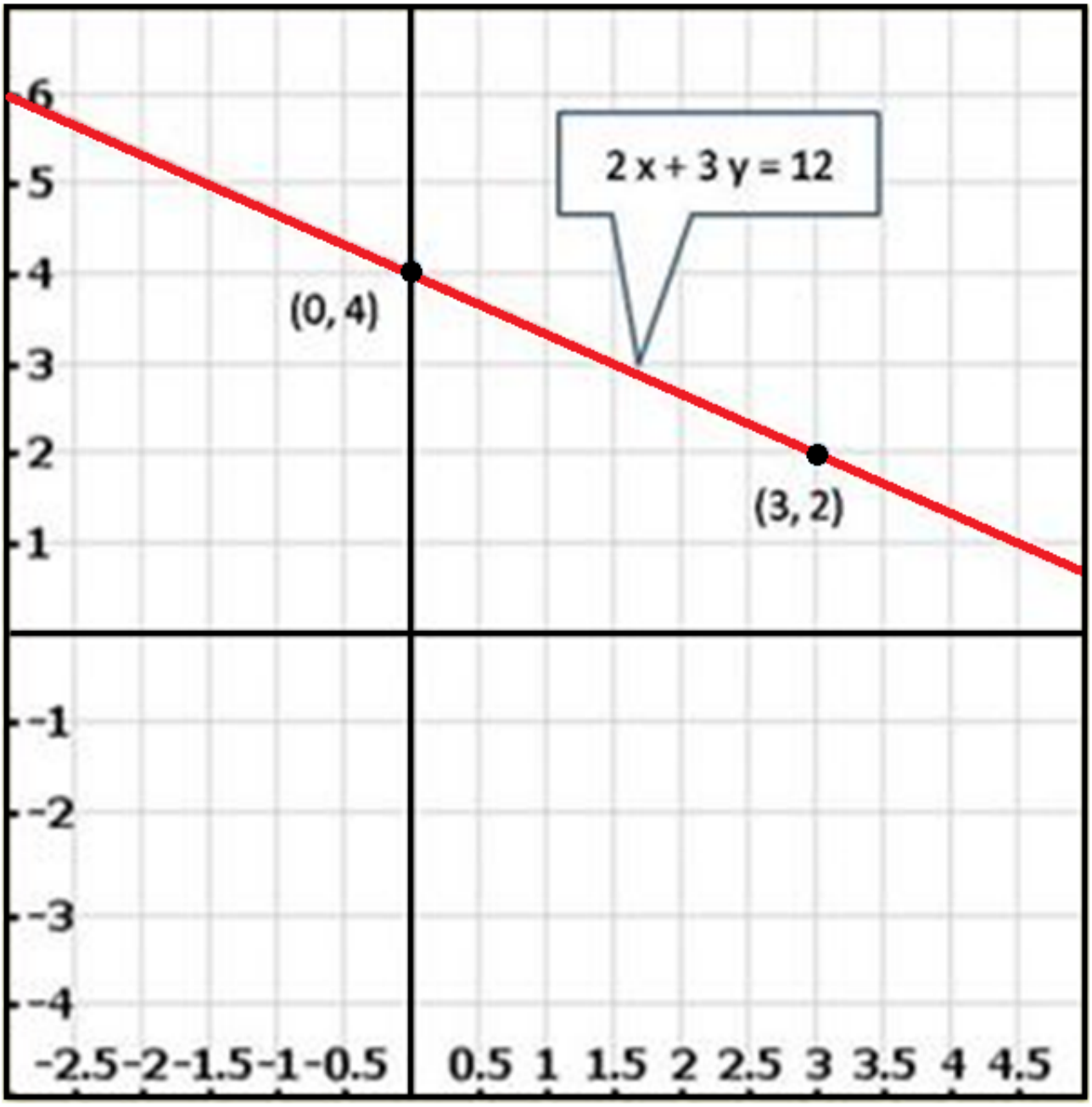
$\therefore \text{Area of } \triangle ABC = 12\text{sq. units.}$

18. Draw the graph of the equation 2x + 3y = 12. From the graph, find the coordinates of the point:
    i. Whose y-coordinates is 3.
    ii. whose x-coordinates is -3.

Ans. : Graph of the equations 2x + 3y = 12: We have, 2x + 3y = 12 ⇒ 2x = 12 - 3y $\Rightarrow x = \frac{12-3y}{2}$ Putting y = 2, we get $x = \frac{12-3\times 2}{2} = 3$ Putting y = 4, we get $x = \frac{12-3\times 4}{2} = 0$ Thus, (3,

0) and (0, 4) are two points on the line 2x + 3y =12. The graph of the line represented by the equation 2x + 3y 12:

x	0	3
y	4	2



i. To find the coordinates of the point when y = 3, we draw a line parallel to x-axis and passing throught (0, 3). This line meets the graph of 2x + 3y = 12 at a point P from which we draw a line parallel to y-axis which crosses x-axis at $x = \frac{3}{2}$. So, the coordinates of the required point are $\left(\frac{3}{2}, 3\right)$.

ii. To find the coordinates of the point when x = -3, we draw a line parallel to y-axis and passing throught (-3, 0). This line meets the graph of 2x + 3y = 12 at a point P from which we draw a line parallel to x-axis which crosses y-axis at y = 6. So, the coordinates of the required point are (-3, 6).

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