Section A:

1. Express x/4 – 3y = – 7 in the form of ax + by + c = 0.

Answer: To express x/4 – 3y = – 7 in the form of ax + by + c = 0, we need to follow the standard form of a linear equation. The general form of a linear equation is ax + by + c = 0, where a, b, and c are constants. So, the equation x/4 – 3y = – 7 can be expressed in the form of ax + by + c = 0 as x - 12y - 28 = 0.

2. Express each of the following equations in the form of ax + by + c = 0 and write the values of a, b, and c.

x – 5 = √3y

Answer:

x−5 = √3y

⇒ x −5 − √3y = 0

⇒ x− 3√3y− 5 = 0

Ax + by + c = 0

Compare both we get

A = 1, b = −√3 and c =−5

3. If (1, -2) is a solution of the equation 2x – y = p, then find the value of p.

Answer:

(1, -2) is a solution of the equation 2x – y = p

So x = 1, and y =-2, sub in 2x – y = p, we get

2(1) – (-2) = p

2 + 2 = p

P = 4

4. Find the point on the x-axis from where the graph of the linear equation x - 5y = 3 will pass.

Answer:

Let the point on the x-axis be (a,0)

Putting x = a and y = 0

$a - 5 \times 0 = 3$

$a = 3$

So the point is (3,0)

5. A linear equation in two variables is of the form px + qy + r = 0 where

A. $p \neq 0, q \neq 0$

B. $p = 0 , q \neq 0$

C. $p \neq 0, q = 0$

D. p=0 r=0

Answer: (A)

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

A. $0.x + 0.y = 7$

B. $1.x + 0.y = 7$

C. $1.x + 1.y = 7$

D. $0.x + 1.y = 7$

Answer : (B)

7. The equation 2x + 5y = 7 has a unique solution, if x, y are

(a) Natural numbers

(b) Positive real numbers

(c) Real numbers

(d) Rational numbers

Answer: (a)

8. Find the area of a triangle formed between the x-axis, y-axis, and the line

(x + y = -7)

(a) 24.5 units

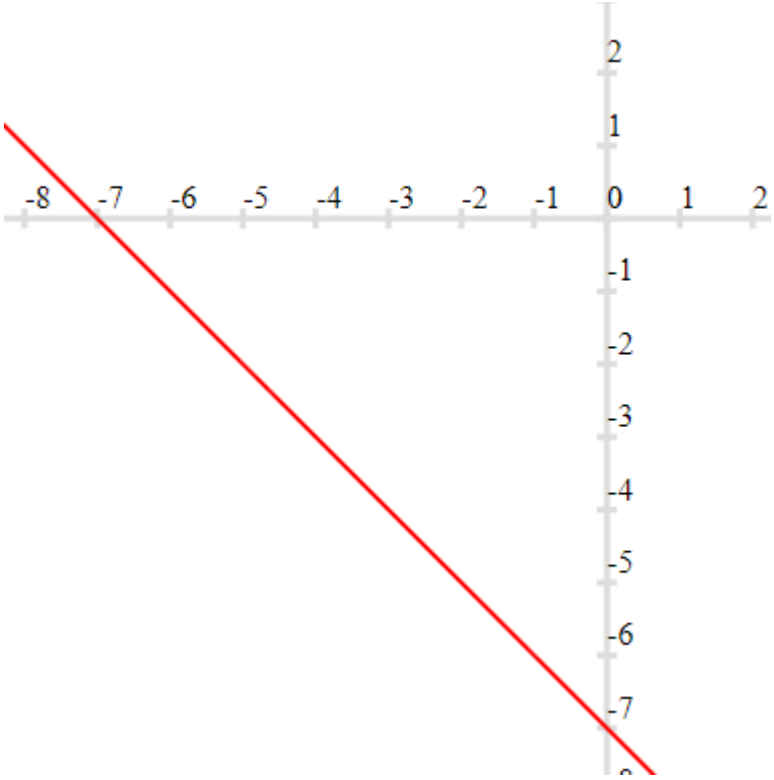
(b) 49 units

(c) 14 units

(d) 21 units

Answer:(a)

The graph of the line (x + y = -7) is show below



We can observe that the triangle is formed by x axis, y-axis, and this line is a right-angle triangle with a base of 7 units and height of 7 units.

So, Area= $\frac{1}{2}$ x 7×7 = 24.5

9. Which of the points does not lie on x-axis or y-axis

(a) (10,0)

(b) (10,-10)

(c) (0,1)

(d) (-1,0)

Answer: (b)

10. if ax + 3y = 25 and y = 1 find value of x

Answer:

ax + 3y = 25

Putting y=1

ax+3=25ax+3=25

ax=22

x=$\frac{22}{a}$

11. Find whether (a,a) lies on the lines y− x = 0 or not.

Answer: By putting the values x = a and y = a

a−a=0

0=0

So, point (a,a) lie on the line

12: If x = 2 α + 1 and y = α -1 is a solution of the equation 2x – 3y + 5 = 0, find the value of α.

Answer:

Given, (2 α + 1, α – 1) is the solution of equation 2x – 3y + 5 = 0.

Substituting x = 2 α + 1 and y = α – 1 in 2x – 3y + 5 = 0, we get

2(2 α + 1) – 3(α – 1) + 5 = 0

4 α + 2 – 3 α + 3 + 5 = 0

α + 10 = 0

α = – 10

The value of α is -10.

Section B

Q1. Represent 2x + 3y = 6 by a graph. Write the coordinates of the point where it meets: (a) x-axis (b) y-axis

Answer:

If the graph of the linear equation 2 x + 3y = 6 meets the y-axis, then x = 0.

Substituting the value of x = 0 in equation 2x + 3y = 6, we get

$2 \times 0 + 3y = 6$

$\Rightarrow 3y = 6$

$\Rightarrow y = \frac{6}{3} \Rightarrow y = 2$

So, the point of meeting is (0, 2).

Since the graph of linear equation 2x + 3y = 6 meets the x-axis;

Put y = 0 in 2x + 3y = 6(at x axis the value of y coordinate is 0)

$\Rightarrow 2x + 3(0) = 6$

$\Rightarrow 2x + 0 = 6$

$\Rightarrow x = \frac{6}{2} \Rightarrow x = 3$

Hence, the required point is (3, 0).

Q2. If (2,3) and (4, 0) lie on the graph of equation ax + by = 1. Find the value of a and b. Plot the graph of the equation obtained.

Answer:

If (2,3) and (4,0) lie on the graph of equation $ax + by = 1$, then the given points satisfy the equation $ax + by = 1$
Hence, substitute the values of x and y as in coordinate (2,3) in equation $ax + by = 1$
$ax + by = 1$
$\therefore 2a + 3b = 1 \quad \ldots (1)$
Substitute the values of x and y as in coordinate (4,0) in equation $ax + by = 1$
$ax + by = 1$
$\therefore 4a + 3(0) = 1$
$\therefore 4a = 1$
$\therefore a = \frac{1}{4} \quad \ldots (2)$

Substitute $a = \frac{1}{4}$ in (1)

$2a + 3b = 1$
$\therefore 2\left(\frac{1}{4}\right) + 3b = 1$
$\therefore \frac{1}{2} + 3b = 1, \therefore 3b = 1 - \frac{1}{2} = \frac{1}{2}$
$\therefore b = \frac{1}{6}$

Q3. Show that the points A (1, 2), B (– 1, – 16), and C (0, – 7) lie on the graph of the linear equation y = 9x – 7.

Answer:

We have the equation,

y = 9x – 7

For A (1, 2),

Substituting (x,y) = (1, 2),

We get,

2 = 9(1) – 7

2 = 9 – 7

2 = 2

For B (–1, –16),

Substituting (x,y) = (–1, –16),

We get,

–16 = 9(–1) – 7

-16 = – 9 – 7

-16 = – 16

For C (0, –7),

Substituting (x,y) = (0, –7),

We get,

– 7 = 9(0) – 7

-7 = 0 – 7

-7 = – 7

Hence, the points A (1, 2), B (–1, –16) and C (0, –7) satisfy the line y = 9x – 7.

Thus, A (1, 2), B (–1, –16), and C (0, –7) are solutions of the linear equation

y = 9x – 7

Therefore, the points A (1, 2), B (–1, –16), and C (0, –7) lie on the graph of linear equation y = 9x – 7.

Q4: Check which of the following are solutions of the equation 2x – y = 6 and which are not:

(i) (3 , 0) (ii) (0 , 6) (iii) (2 , -2) (iv) (√3, 0) (v) (1/2 , -5)

Answer:

(i) Check for (3, 0)

Put x = 3 and y = 0 in equation 2x – y = 6

2(3) – (0) = 6

6 = 6

True statement.

⇒ *(3,0) is a solution of 2x – y = 6.*

(ii) Check for (0, 6)

Put x = 0 and y = 6 in 2x – y = 6

2 x 0 – 6 = 6

-6 = 6

False statement.

⇒ *(0, 6) is not a solution of 2x – y = 6.*

(iii) Check for (2, -2)

Put x = 0 and y = 6 in 2x – y = 6

2 x 2 – (-2) = 6

4 + 2 = 6

6 = 6

True statement.

⇒ *(2,-2) is a solution of 2x – y = 6.*

(iv) Check for (√3, 0)

Put x = √3 and y = 0 in 2x – y = 6

2 x √3 – 0 = 6

2 √3 = 6

False statement.

⇒*(√3, 0) is not a solution of 2x – y = 6.*

(v) Check for (1/2, -5)

Put x = 1/2 and y = -5 in 2x – y = 6

2 x (1/2) – (-5) = 6

1 + 5 = 6

6 = 6

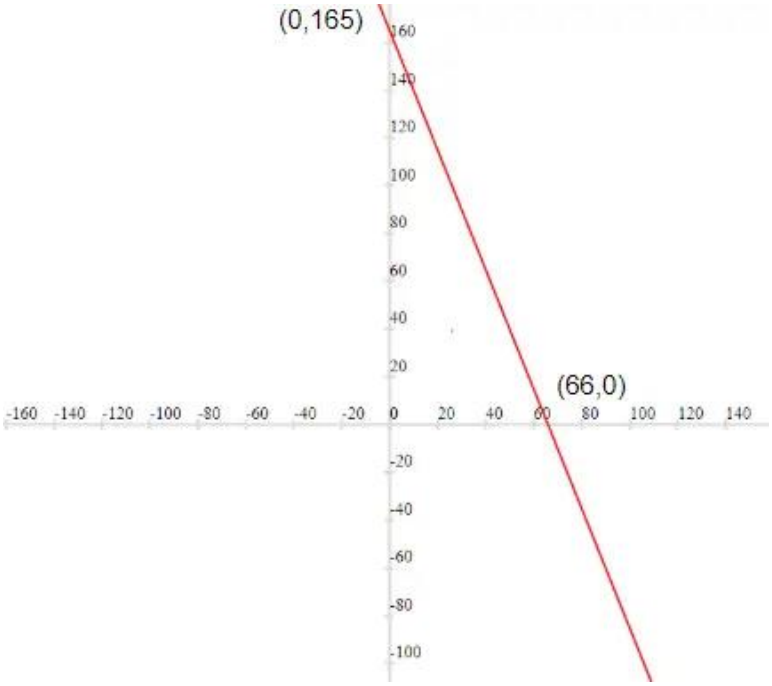
True statement.

⇒ *(1/2, -5) is a solution of 2x – y = 6.*

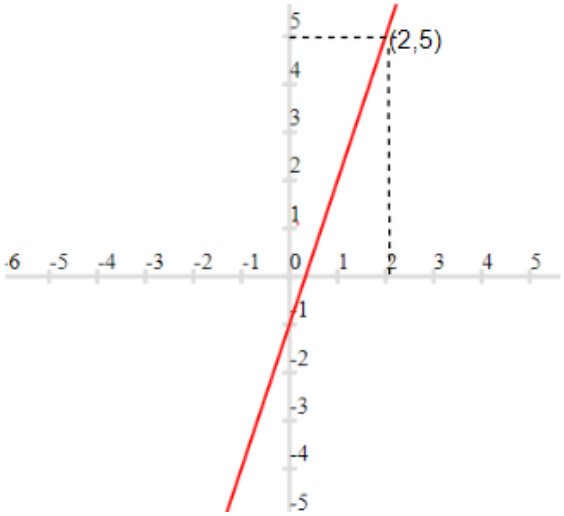
Section C

Q5. The cost of 5 kg apples and 2 kg oranges is Rs. 330. Let the cost of 1 kg apples be Rs. x and that of 1 kg be Rs. y. Write the given data in the form of a linear equation in two variables. Also, represent it graphically. Answer:

5x + 2y = 330



Q6. Draw the graph of the equation y = mx + c for m = 3 and c = -1 (a straight line in Cartesian plane). Read from the graph the value of y when x = 2. Answer:



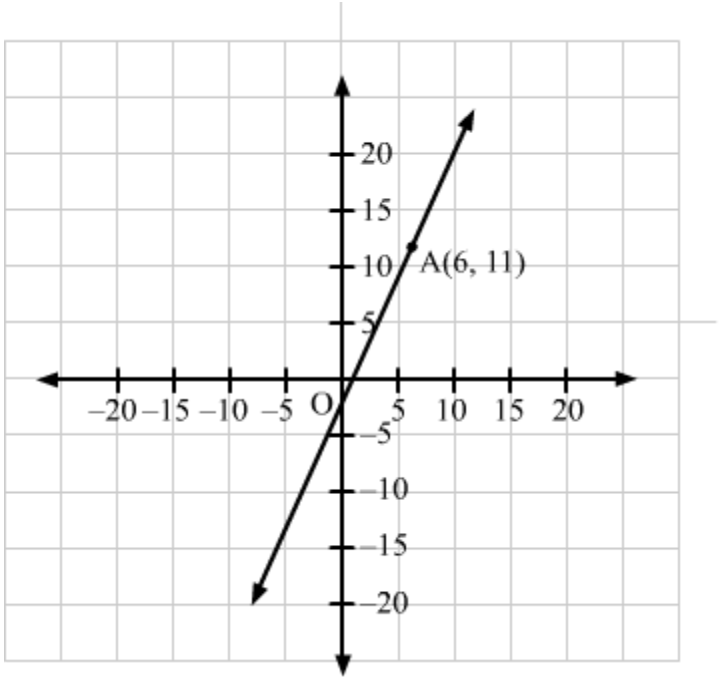
Q7. If the number of hours for which a laborer works is x and y are his wages (in rupees) and y = 2x − 1, then draw the graph of the work-wages equation. From the graph, find the wages of the labourer if he works for 6 hours.

Answer:

The values of x and y satisfying the given equation y = 2x − 1 are:

x	0	1	2	3	4
y	–1	1	3	5	7

The graph of the given equation y = 2x − 1 is as follows:



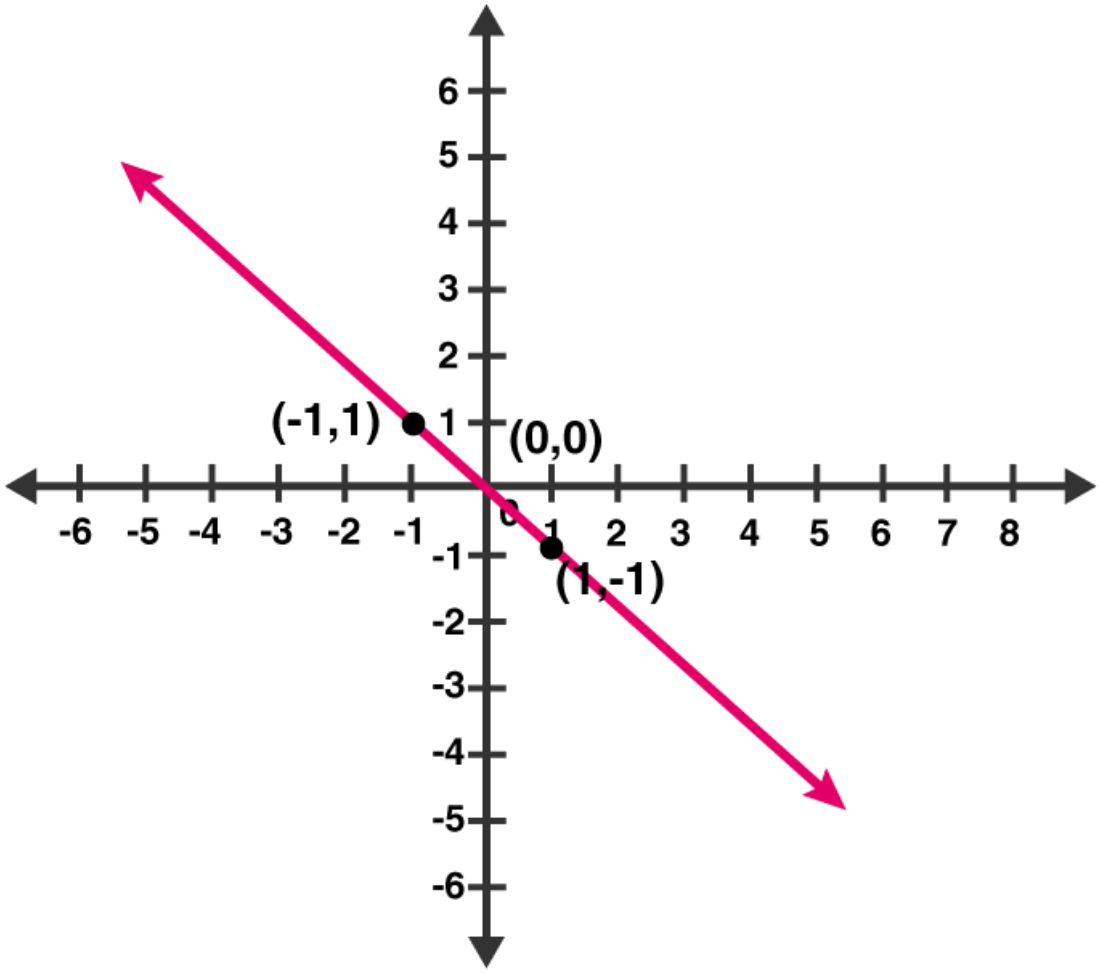
In the graph, a point A(6, 11) lies on the line.

So, at x = 6, y = 11

Hence, the wages of the labourer if he works for 6 hours is Rs 11.

Q8: From the choices given below, choose the equations whose graph is given in the figure.

(i) y = x **(ii) x + y = 0** **(iii) y = 2x** **(iv) 2 + 3y = 7x**



Answer:

From the graph, coordinates (1, -1) and (-1, 1) are solutions of one of the equations.

We will put the value of all the coordinates in each equation and check which equation satisfies them.

(i) y = x

Put x = 1 and y = -1 ,

Thus, 1 ≠ -1

L.H.S ≠ R.H.S

Putting x = -1 and y = 1 ,

-1 ≠ 1

L.H.S ≠ R.H.S

Therefore, y = x does not represent the graph in the given figure.

(ii) x + y = 0

Putting x = 1 and y = -1 ,

⇒ 1 + (-1) = 0

⇒ 0 = 0

L.H.S = R.H.S

Putting x = -1 and y = 1 ,

(-1) + 1 = 0

0 = 0

L.H.S = R.H.S

Thus, the given solutions satisfy this equation.

(iii) y = 2x

Putting x = 1 and y = -1

-1 = 2 (Not True)

Putting x = -1 and y = 1

1 = -2 (Not True)

Thus, the given solutions do not satisfy this equation.

(iv) 2 + 3y = 7x

Putting x = 1 and y = -1

2 – 3 = 7

-1 = 7 (Not true)

Putting x = -1 and y = 1

2 + 3 = -7

5 = -7 (Not True)

Thus, the given solution does not satisfy this equation.