[10]

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

1. x = 2, y = -1 is a solution of the linear equation:

(A) x + 2y = 0 (B) x + 2y = 4 (C) 2x + y = 0 (D) 2x + y = 5

Ans. :

a. x + 2y = 0

Solution:

Substituting x = 2 and y = -1 in the following equations:
L.H.S. = x + 2y = 2 + 2(-1) = 2 - 2 = 0 = R.H.S.
L.H.S. = x + 2y = 2 + 2(-1) = 2 - 2 = 0 ≠ 4 ≠ R.H.S.
L.H.S. = 2x + y = 2(2) + (-1) = 4 - 1 = 3 ≠ 0 ≠ R.H.S.
L.H.S. = 2x + y = 2(2) + (-1) = 4 - 1 = 3 ≠ 5 ≠ R.H.S.
Hence, correct option is (a).

2. A linear equation in two variables x and y is of the form ax + by + c = 0, where:

(A) $\mathrm{a} \neq 0, \mathrm{b} \neq 0$ (B) $\mathrm{a} \neq 0, \mathrm{b} = 0$ (C) $\mathrm{a} = 0, \mathrm{b} \neq 0$ (D) $\mathrm{a} = 0, \mathrm{c} = 0$

Ans. :

a. $\mathrm{a} \neq 0, \mathrm{b} \neq 0$

Solution:

A linear equation in tow variables x and y is of the form ax + by + c = 0, where $\mathrm{a} \neq 0$ and $\mathrm{b} \neq 0$, since if either a or be is 0, the degree of the equation would be but it would not be a linear equation in tow variables.
If both a and b are 0, then the equation is not linear.

3. The graph of the equation x + y = 4.

(A) Intersects both the axis. (B) Parallel to the x-axis. (C) Intersects x-axis only. (D) Intersects y-axis only.

Ans. :

a. Intersects both the axis.

Solution:

The graph of the equation x + y = 4,
Put x = 0 cut y axis at y = 4,
Put y = 0 cut x axis at x = 4.

4. All linear equations in two variables have _____.

(A) One solution (B) Infinitely many solutions (C) Three solutions (D) Two solution

Ans. :

b. Infinitely many solutions

5. The graph of the linear equation 2x + 3y = 6 is a line which meets the x-axis at the point.

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

Ans. :

c. (3, 0)

Solution:

2x + 3y = 6 meets the x-axis.
Put y = 0,
2x + 3(0) = 6
x = 3
Therefore, graph of the given line meets x-axis at (3, 0).

6. The graph of the linear equation 2x + 5y = 10 meets the x-axis at the point.

(A) (0, 5) (B) (5, 0) (C) (0, 2) (D) (2, 0)

Ans. :

b. (5, 0)

Solution:

If the graph of the linear equation 2x + 5y = 10 meets the x-axis, then y = 0.
Substituting the value of y = 0 in equation 2x + 5y = 10, we get
2x + 5(0) = 10
⇒ 2x = 10

$\Rightarrow x = \frac{10}{2}$

$\Rightarrow x = 5$

So, the point of meeting is (5, 0).

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

(A) Natural numbers. (B) Rational numbers. (C) Positive real numbers. (D) Real numbers.

Ans. :

a. Natural numbers.

Solution:

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

If we take x = 1 and y = 1, the given equation is satisfied.

8. The equation of the y-axis is:

(A) x = 0 (B) y = 0 (C) x + y = 0 (D) x = y

Ans. :

a. x = 0

Solution:

Since the x-coordinate of any point on y-axis is always 0.

So, the equation of the y-axis is x = 0.

9. Write the correct answer in the following:

Any point on the X-axis is of the form,

(A) (x, y) (B) (0, y) (C) (x, 0) (D) (x, x)

Ans. :

c. (x, 0)

Solution:

Every point on the X-axis has its y-coordinate equal to zero. i.e., y = 0.

10. How many lines pass through two points?

(A) Two. (B) Only one. (C) Many. (D) Three.

Ans. :

b. Only one.

Solution:

Only one because if a line is passing through two points then that two points are solution of a single linear equation so only one line passes over two given points.

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

11. Find four different solutions of the equation x + 2y = 6

Ans. : We have By inspection, x = 2, y = 2 is a solution because for x = 2, y = 2 x + 2y = 2 + 4 = 6

Now, let us choose x = 0. With this value of x, the given equation reduces to 2y = 6 which has the unique solution y = 3. So x = 0, y = 3 is also a solution of x + 2y = 6.

Similarly, taking y = 0, the given equation reduces to x = 6. So, x = 6, y = 0 is a solution of x + 2y = 6 as well. Finally, let us take y = 1. The given equation now reduces to x + 2 = 6, whose solution is given by x = 4. Therefore, (4, 1) is also a solution of the given equation. So four of the infinitely many solutions of the given equation are: (2, 2), (0, 3), (6, 0) and (4, 1). Hence the required Solutions.

12. The cost of ball pen is Rs. 5 less than half of the cost of fountain pen. Write this statement as a linear equation in two variables.

Ans. : Let the cost of fountain pen be y and cost of ball pen be x.

According to the given equation, we have

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

$\Rightarrow 2x = y - 10$

$\Rightarrow 2x - y + 10 = 0$

Here y is the cost of one fountain pen and x is that of one ball pen.

13. If x = -1, y = 2 is a solution of the equation 3x + 4y = k, find the value of k.

Ans. : We are given, 3x + 4y = k

Given that, (-1, 2) is the solution of equation 3x + 4y = k.

Substituting x = -1 and y = 2 in 3x + 4y = k,

We get; 3x - 1 + 4 × 2 = k

K = -3 + 8

k = 5

14. If the point (2, -2) lies on the graph of the linear equation 5x + ky = 4, find the value of k.

Ans. : It is given that (2, -2) is a solution of the equation 5x + ky = 4
$\therefore$ 5 × 2 + k × (-2) = 4
$\Rightarrow$ 10 - 2k = 4
$\Rightarrow$ -2k = 4 - 10
$\Rightarrow$ -2k = -6
$\Rightarrow k = \frac{6}{2}$
$\Rightarrow$ k = 3

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

15. Write two solutions of the form x = 0, y = a and x = b, y = 0 for the following equations:
2x + 3y = 24

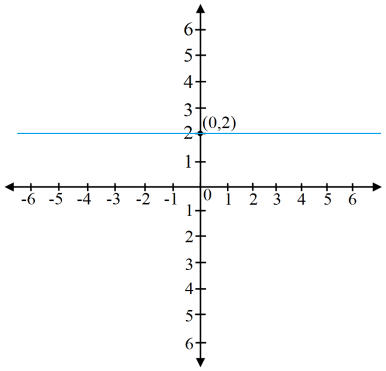
Ans. : We are given, 2x + 3y = 24
Substituting x = 0 in the given equation, we get; 2 × 0 + 3y = 24
3y = 24
$y = \frac{24}{3}$
y = 8
Thus x = 0 and y = 8 is a solution of 2x + 3y = 24
Substituting y = 0 in the given equation, we get;
2x + 3 × 0 = 24
2x = 24
$x = \frac{24}{2}$
x = 12
Thus x = 12 and y = 0 is a solution of 2x + 3y = 24

16. Write two solutions of the form x = 0, y = a and x = b, y = 0 for the following equations:
-4x + 3y = 12

Ans. : We are given, -4x + 3y = 12
Substituting x = 0 in the given equation, we get;
-4 × 0 + 3y = 12
3y = 12
y = 4
Thus x = 0 and y = 4 is a solution of the -4x + 3y = 12
Substituting y = 0 in the given equation, we get;
-4x + 3 × 0 = 12 - 4x = 12
$x = -\frac{12}{4}$
x = -3
Thus x = -3 and y = 0 is a solution of -4x + 3y = 12

17. Solve the equation 2y - 1 = y + 1 and represent it graphically on the coordinate plane.

Ans. :
We are given,
2y - 1 = y + 1
we get,
2y - y = 1 + 1
y = 2
The representation of the solution on the Cartesian plane, it is a line parallel to y axis passing through the point (0, 2) is shown below



18. If the point (a, 2) lies on the graph of the linear equatio 2x - 3y + 8 = 0, find the value of a.

Ans. :

We are given (a, 2) lies on the graph of linear equation 2x - 3y + 8 = 0.

So, the given co-ordinates are the solution of the equation 2x - 3y + 8 = 0.

Therefore, we can calculate the value of a by substituting the value of given co-ordinates in equation 2x - 3y + 8 = 0.

Substituting x = a and y = 2 in equation 2x - 3y + 8 = 0, we get

$2 \times a - 3 \times 2 + 8 = 0$

$2a - 6 + 8 = 0$

$2a + 2 = 0$

$2a = -2$

$a = -\frac{2}{2}$

$a = -1$

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