*** Choose the right answer from the given options. [1 Marks Each]** **[25]**

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

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

Ans. :

c. Natural numbers

Solution:

The equation 2x + 5y = 7 has a unique solution, if x, y are natural numbers.
In natural numbers, there exists only one pair (1, 1) which satisfies the given equation.
But for rational numbers, real numbers, positive real numbers, there exist many solution pairs to satisfy the equation.

2. If (-2, 5) is a solution of 2x + my = 11, then the value of 'm' is:

(A) -2 (B) 2 (C) 3 (D) -3

Ans. :

c. 3

Solution:

If (-2, 5) is a solution of 2x + my = 11
then it will satisfy the given equation
2(-2) + 5 m = 11
-4 + 5m = 11
5m = 11 + 4
5m = 15
$\mathrm{m} = \frac{15}{5} = 3$
$\mathrm{m} = 3$

3. If (3, 2) is the solution 3x - ky = 5, then k equals of the equation.

(A) 2 (B) 4 (C) 3 (D) $\frac{1}{2}$

Ans. :

a. 2

4. The graph of linear equation x + 2y = 2, cuts the y - axis at:

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

Ans. :

c. (0, 1)

Solution:

x + 2y = 2
$\mathrm{y} = \frac{(2-\mathrm{x})}{2}$
If x = 0, then;
$\mathrm{y} = \frac{(2-0)}{2} = \frac{2}{2} = 1$
Hence, x + 2y = 2 cuts the y - axis at (0, 1).

5. If x = 3 and y = -2 satisfies 2x - 3y = k, then the value of k is:

(A) -2 (B) 10 (C) 12 (D) 3

Ans. :

c. 12

Solution:

If x = 3 and y = -2 satisfies 2x - 3y = k.

It means x = 3 and y = -2 is a solution of equation 2x - 3y = k

2 × 3 - 3(-2) = k

6 + 6 = k

k = 12

6. Write the correct answer in the following:

x = 5 and y = 2 is a solution of the linear equation,

(A) x + 2y = 7 (B) 5x + 2y = 7 (C) x + y = 7 (D) 5x + y = 7

Ans. :

c. x + y = 7

Solution:

x = 5, y = 2 is a solution of the linear equation x + y = 7, as 5 + 2 = 7.

7. The value of k if x = 3 and y = -2 is a solution of the equation 2x - 13y = k is:

(A) 32 (B) 30 (C) 31 (D) 23

Ans. :

a. 32

Solution:

We have to find the value of 'k' if x = 3 and y = -2 is a solution of the equation 2x - 13y = k

2x - 13y = k

2(3) - 13(-2) = k

6 + 26 = k

k = 32.

8. The graph of the linear equation 4x + 2y = 12, cuts the x-axis at the point:

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

Ans. :

a. (3, 0)

Solution:

The graph of the linear equation 4x + 2y = 12, cuts the x-axis at the point when line cut x-axis the co-ordinate of y becomes zero.

So we put y = 0 in given equation to find the co-ordinate,

4x + 2y = 124x + 2(0) = 124x = 12

$x = \frac{12}{4}$

x = 3

So the required coordinate is (3, 0).

9. The graph of x = - 4 is a straight line.

(A) Parallel to x-axis. (B) Parallel to y-axis. (C) Passing through origin. (D) Intersecting the axes.

Ans. :

b. Parallel to y-axis.

Solution:

We know that the general equation of a line parallel to y-axis is x = a.
So x = -4 is a line parallel to y-axis.

10. The graph of the linear equation 2x + 3y = 6 cuts the y - axis at the point.

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

Ans. :

b. (0, 2)

Solution:

Given that the graph of the linear equation 2x + 3y = 6 cuts the y - axis at the point.
Let the point be "P".
Hence, the x - coordinate of point P is 0.
Now, substitute x = 0 in the given equation,
2 (0) + 3y = 6
3y = 6
y = 2
Hence, the cooridnate point is (0, 2).

11. If x = 3 and y = -2 satisfies 5x - y = k, then the value of k is:

(A) 3 (B) -2 (C) 17 (D) 12

Ans. :

c. 17

Solution:

If x = 3 and y = -2 satisfies 5x - y = k
Then
5x - y = k
5 × 3 - (-2) = k
15 + 2 = k
k = 17.

12. Each of the points (-2, 2), (0, 0), (2, 2) satisfies the linear equation:

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

Ans. :

b. x + y = 0

Solution:

Since given that each of the three points is a solution of the linear equation, all three points have to satisfy the linear equation.
We need to check for each of the four given equations.
Substituting x = -2 and y = 2 in option (b),
We get:
LHS
= x + y
= -2 + 2
0 = RHS
∴ x = -2 and y = 2
Satisfy the given linear equation.
Substituting x = 0 and y = 0 in option (b),
We get:
LHS

= x + y
= 0 + 0
0 = RHS
∴ x = 0 and y = 0
Satisfy the given linear equation.
Substituting x = -2 and y = 2 in option (b),
We get:
LHS
= x + y
= 2 - 2
0 = RHS
∴ x = 2 and y = -2
Satisfy the given linear equation.
So, clearly all the three points satisfy the equation
x + y = 0.

13. Write the correct answer in the following:
If a linear equation has solutions (-2, 2), (0, 0) and (2, -2), then it is of the form,
(A) y – x = 0 (B) x + y = 0 (C) -2x + y = 0 (D) -x + 2y = 0

Ans. :

b. x + y = 0

Solution:

Thinking Process,

i. Firstly, consider a linear equation ax + by + c = 0.
ii. Secondly, substitute all points one by one and get three different equations.
iii. Further, simplify the three equations and then substitute the values of a, b and c in the considered equation.

14. The condition that the equation ax + by + c = 0 represents a linear equation in two variables is:
(A) a ≠ 0, b = 0 (B) b ≠ 0, a = 0 (C) a = 0, b = 0 (D) a ≠ 0, b ≠ 0

Ans. :

d. a ≠ 0, b ≠ 0

15. If the line represented by the equation 3x + ky = 9 passes through the points (2, 3), then the value of k is:
(A) 2 (B) 4 (C) 3 (D) 1

Ans. :

d. 1

Solution:

If the line represented by the equation 3x + ky = 9 passes through the points (2, 3) then (2, 3) will satisy the equation 3x + ky = 9
3(2) + 3k = 9
⇒ 6 + 3k = 9
⇒ 3k = 9 - 6
⇒ 3k = 3
⇒ k = 1

16. 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

Solution:

2x + 3y = k

k = 2 (1) + 3 (2)

= 2 + 6 = 8

17. If the point (3, 4) lies on the graph of 3y = ax + 7 then the value of a is:

(A) $\frac{2}{7}$ (B) $\frac{2}{5}$ (C) $\frac{5}{3}$ (D) $\frac{3}{5}$

Ans. :

c. $\frac{5}{3}$

Solution:

Given equation: 3y = ax + 7

Also, (3, 4) lies on the graph of the equation.

Putting x = 3, y = 4 in the equation, we get

3 × 4 = 3a + 7

⇒ 12 = 3a + 7

⇒ 3a = 12 - 7 = 5

$\Rightarrow a = \frac{5}{3}$.

18. The linear equation 3x - y = x - 1 has:

(A) Two solutions. (B) No solution. (C) Infinitely many solutions. (D) A unique solution.

Ans. :

c. Infinitely many solutions.

Solution:

3x - y = x - 1

y = 3x - x + 1

y = 2x + 1

This is linear equation of two variable. If we take any random value of x and solve y corresponding value of x. We will get infinite many solutions.

19. The cost of 2kg of apples and 1kg of grapes on a day was found to be ₹ 160. A linear equation in two variables to represent the above data is:

(A) x + y = 160 (B) 2x - y = 160 (C) x - 2y = 160 (D) 2x + y = 160

Ans. :

d. 2x + y = 160

Solution:

Let the cost of apples be ₹ x per Kg and cost of grapes be ₹ y per Kg. The cost of 2kg of apples and 1kg of grapes on a day was found to be ₹ 160.

So the equation will be 2x + y = 160.

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

(A) a = 0, c = 0 (B) a ≠ 0, b = 0 (C) a = 0, b ≠ 0 (D) a ≠ 0, b ≠ 0

Ans. :

d. a ≠ 0, b ≠ 0

Solution:

A linear equation in two variables is of the form ax + by + c = 0, where a ≠ 0, b ≠ 0.

If the values of "a" and "b" are equal to 0, the equation becomes c = 0.

Hence, the values of a and b should not be equal to 0.

21. The force applied on a body is directly proportional to the acceleration produced on it. The equation to represent the above statement is:

(A) y = kx (B) y + x = 0 (C) None of these (D) y = x

Ans. :

a. y = kx

Solution:

Let force applied be y and acceleration produced be x. The force applied on a body is directly proportional to the acceleration produced on it.

$Y \propto x$

y = kx

Where k is proportionality constant.

22. The taxi fare in a city is as follows: For the first kilometer, the fare is ₹ 8 and for the subsequent distance it is ₹ 5 per kilometer. Taking the distance covered as x km and total fare as ₹ y, write a linear equation for this information.

(A) x = 5y - 3 (B) y = 5x + 3 (C) x = 5y + 3 (D) y = 5x - 3

Ans. :

b. y = 5x + 3

Solution:

Taxi fare for first kilometer = ₹ 8

Taxi fare for subsequent distance = ₹ 5

Total distance covered = x

Total fare = y

Since the fare for first kilometer = ₹ 8

According to problem, Fare for (x - 1) kilometer = 5(x - 1)

So, the total fare y = 5(x - 1) + 8

⇒ y = 5(x - 1) + 8

⇒ y = 5x - 5 + 8

⇒ y = 5x + 3

Hence, y = 5x + 3 is the required linear equation.

23. The graph of a linear equation x - 5y + 3 = 0 cuts the x-axis at the point.

(A) (-5, 0) (B) (5, 0) (C) (-3, 0) (D) (3, 0)

Ans. :

c. (-3, 0)

Solution:

When a line cuts x-axis in that case y co-ordinate is 0.

So to find the co-ordinate of x we put y = 0 in given equation,

x - 5y + 3 = 0

at y = 0

x - 5.0 + 3 = 0

x + 3 = 0

x = -3

So the co-ordinate are (-3, 0)

24. Point (3, 4) lies on the graph of the equation 3y = kx + 7. The value of k is:

(A) $\frac{4}{3}$ (B) $\frac{5}{3}$ (C) 3 (D) $\frac{6}{3}$

Ans. :

b. $\frac{5}{3}$

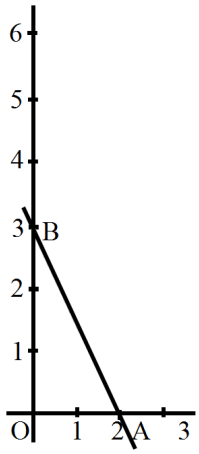
25. The area of the triangle formed by the line 3x + 4y = 12 and the co-ordinate axis is:

(A) 6 sq. units. (B) 12 sq. units. (C) 4 sq. units. (D) 3 sq. units.

Ans. :

a. 6 sq. units.

Solution:



To find the area of the triangle AOB formed by the line 3x + 4y = 12 and co-ordinate axis we put x = 0 in given equation to find the point on y axies.

So, at x = 0

3(0) + 4y = 12

4y = 12

We get y = 3

At y = 0

3x + 4(0) = 12

3x = 12

We get x = 4

So the line cut y axis at 3 and x axis at 4

So the hight of triangle AOB is OB = 3 unit and base OA = 4 unit

Area ot triangle AOB = 12(base × height)

= 12 × 4 × 3

= 6 unit square.

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