Important Questions for Class 9 Maths

Chapter 4- Linear Equations in Two Variables

Multiple Choice Questions (MCQs)

1. Which of the following is the general form of a linear equation in two variables?

a) ax+by=c
b) $ax^2 + by^2 = c$
c) ax+by+c=0
d) Both a and c

Answer: d) Both a and c

2. If x=2 and y=3 is a solution to the equation 3x + 2y = 12, then which of the following is true?

a) The equation is consistent.
b) The equation is inconsistent.
c) The equation has no solution.
d) None of the above.

Answer: a) The equation is consistent.

3. The graph of the linear equation x + y = 4 intersects the x-axis at:

a) (0, 4)
b) (4, 0)
c) (0, 0)
d) (-4, 0)

Answer: b) (4, 0)

4. If (x_1, y_1) **and** (x_2, y_2) **are solutions of the linear equation ax + by = c, then the line through these two points is:**

a) Parallel to the x-axis
b) Parallel to the y-axis
c) A straight line
d) A curve

Answer: c) A straight line

5. The solution of the system of equations 3x+4y=7 and 2x−y=4 is:

a) (1, 2)
b) (2, 1)
c) (1, 1)
d) (3, 1)

Answer: b) (2, 1)

6. Which of the following is the graph of the equation x−y=1?

a) A straight line passing through (1, 0)
b) A straight line passing through (0, 1)
c) A straight line passing through (1, 1)
d) A straight line passing through (-1, 0)

Answer: a) A straight line passing through (1, 0)

7. What is the slope of the line represented by the equation 2x+3y=6?

a) $-\dfrac{2}{3}$

b) $\dfrac{2}{3}$

c) $\dfrac{3}{2}$

d) $-\dfrac{3}{2}$

Answer: a) $-\dfrac{2}{3}$

8. The solution of the linear equation 5x+3y=15 when x=3 is:

a) y=0
b) y=5
c) y=3
d) y=2

Answer: a) y=0

9. Which of the following is not a solution to the equation x + y = 5?

a) (3, 2)
b) (1, 4)
c) (0, 5)
d) (2, 3)

Answer: d) (2, 3)

10. The point where the line 2x + y = 3 meets the y-axis is:

a) (0, 3)
b) (1, 0)
c) (0, -3)
d) (2, 1)

Answer: c) (0, -3)

2 Marks Questions

1. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement.

(Take the cost of a notebook to be Rs x and that of a pen to be Rs y).

Ans. Let the cost of a notebook be RS. X.

Let the cost of a pen be Rs y.

We need to write a linear equation in two variables to represent the statement, "Cost of a notebook is twice the cost of a pen".

Therefore, we can conclude that the required statement will be x=2y.

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

Ans. We know that, if x=2 and y=1 is a solution of the linear equation 2x + 3y=k, then on substituting the respective values of x and y in the linear equation 2x + 3y =k, the LHS and RHS of the given linear equation will not be affected.

2(2)+3(1)=k

Therefore, k=4+3

k=7

Therefore, we can conclude that the value of k, for which the linear equation 2x + 3y =k has x = 2 and y=1 as one of its solutions is 7.

3. Give the equations of two lines passing through (2, 14). How many more such lines are there, and why?

Ans. We need to give the two equations of the line that passes through the point (2,14). We know that infinite number of lines can pass through any given point.

We can consider the linear equations 7x – y=0 and 2x + y=18.

We can conclude that on putting the values x=2 and y=14 in the above mentioned linear equations, we get LHS=RHS.

Therefore, we can conclude that the line of the linear equations 7x – y =0 and 28x -4y =0 will pass through the point (2, 14).

4. If the point (3, 4) lies on the graph of the equation 3y = ax + 7, find the value of a.

Ans. We know that if any point lie on the graph of any linear equation, then that point is the solution of that linear equation.

We can conclude that (3,4) is a solution of the linear equation 3y = ax + 7.

We need to substitute x=3 and y=4 in the linear equation 3y=ax + 7, to get

$3(4) = a(3) + 7$

$\Rightarrow 12 = 3a + 7$

$\Rightarrow 3a = 12 - 7 \Rightarrow 3a = 5$

$\Rightarrow a = \dfrac{5}{3}$

Therefore, we can conclude that the value of a will be $\dfrac{5}{3}$.

5. Which one of the following options is true, and why?

y=3x+5 has

(i) a unique solution, (ii) only two solutions, (iii) infinitely many solutions

Ans. We need to the number of solutions of the linear equation y=3x+5. We know that any linear equation has infinitely many solutions.

Justification:

If x=0 then y=3 X 0 + 5 =5.

If x=1then y= 3 X 1+ 5 =8.

If x=-2then y=3 X (-2) +5= -1.

Similarly we can find infinite many solutions by putting the values of x.

Long Answer Type Questions:

1: Construct a linear equation in two variables to express the following statement.

The cost of a textbook is twice the cost of an exercise book.

Ans. Let the cost of a textbook be x rupees and the cost of an exercise book be y rupees.

The given statement: The cost of a textbook is twice the cost of an exercise book

So, in order to form a linear equation,

the cost of the textbook $=2\times$ the cost of an exercise book.

$\Rightarrow$ x=2y

$\Rightarrow$ x-2y=0.

2: Determine the values of a **,** b **,** c **from the following linear equations by expressing each of them in the standard form** $ax+by+c=0$ **.**

(i) $2x+3y=9.\overline{35}$

Ans. The given linear equation is

$2x+3y=9.\overline{35}$

Subtracting $9.\overline{35}$ from both sides of the equation gives

$2x + 3y - 9.\overline{35} = 0$

Now, by comparing the above equation with the standard form of the linear equation, $ax + by + c = 0$, the values of $a, b,$ and c are obtained as

$a = 2$,

$b = 3$, and

$c = -9.\overline{35}$

(ii) $x - \dfrac{y}{5} - 10 = 0$

Ans. The given linear equation is

$x - \dfrac{y}{5} - 10 = 0$

Now, by comparing the above equation with the standard form of the linear equation, $ax + by + c = 0$, the values of $a, b,$ and c are obtained as

$a = 1$,

$b = -\dfrac{1}{5}$, and

$c = -10$.

(iii) -2x+3y=6

Ans. The given linear equation is

-2x+3y=6

Subtracting 6 from both sides of the equation gives

$-2x+3y-6=0$

Now, by comparing the above equation with the standard form of the linear equation, ax+by+c=0, the values of a,b, and c are obtained as

$a=-2$,

$b=3$, and

$c=-6$.

(iv) x=3y

Ans. The given linear equation can be written as

$1x=3y$

Subtracting 3y from both sides of the equation gives

1x-3y+0=0

Now, by comparing the above equation with the standard form of the linear equation ax+by+c=0, the values of a,b, and c are obtained as

$a=1$,

$b = -3$, and

$c = 0$.

(v) $2x = -5y$

Ans. The given linear equation is

$2x = -5y$.

Adding 5y on both sides of the equation gives

$2x+5y+0=0$.

Now, by comparing the above equation with the standard form of the linear equation, $ax+by+c=0$, the values of $a, b,$ and c are obtained as

$a = 2$,

$b = 5$, and

$c = 0$.

(vi) $3x+2=0$

Ans. The given linear equation is

$3x+2=0$.

Rewriting the equation gives

$3x+0y+2=0$

Now, by comparing the above equation with the standard form of linear equation $ax+by+c=0$, the values of a, b, and c are obtained as

$a = 3$,

$b = 0$, and

$c = 2$.

(vii) $y-2=0$

Ans. The given linear equation is

$y-2=0$

The equation can be expressed as

$0x+1y-2 = 0$

Now, by comparing the above equation with the standard form of the linear equation, $ax+by+c=0$, the values of a, b, and c are obtained as

$a = 0$,

$b = 1$, and

$c = -2$.

3: Identify the actual solutions of the linear equation $x-2y=4$ **from each of the following solutions.**

(i) $(0,2)$

Ans: Substituting $x=0$ and $y=2$ in the Left-hand-side of the equation $x-2y=4$ gives

$x-2y = 0-2(2)$
$= -4$ Therefore, Left-hand-side is not equal Right-hand-side of the given
$\neq 4.$
equation for $(x,y)=(0,2)$.

Hence, $(0,2)$ is not a solution of the equation $x-2y=4$.

(ii) $(2,0)$

Ans. Substituting $x=2$ and $y=0$ in the Left-hand-side of the equation $x-2y=4$ gives

$x-2y = 2-2(0)$
$= 2$ Therefore, Left-hand-side is not equal Right-hand-side of the given
$\neq 4.$
equation for $(x,y)=(2,0)$.

Hence, $(2,0)$ is not a solution of the equation $x-2y=4$.

(iii) $(4,0)$

Ans. Substituting $x=4$ and $y=0$ in the Left-hand-side of the equation $x-2y=4$ gives

$$x\text{-}2y = 4 - 2(0)$$
$$= 4.$$
Therefore, Left-hand-side is equal Right-hand-side of the given equation for $(x,y) = (4,0)$.

Hence, $(4,0)$ is a solution of the equation $x\text{-}2y=4$.