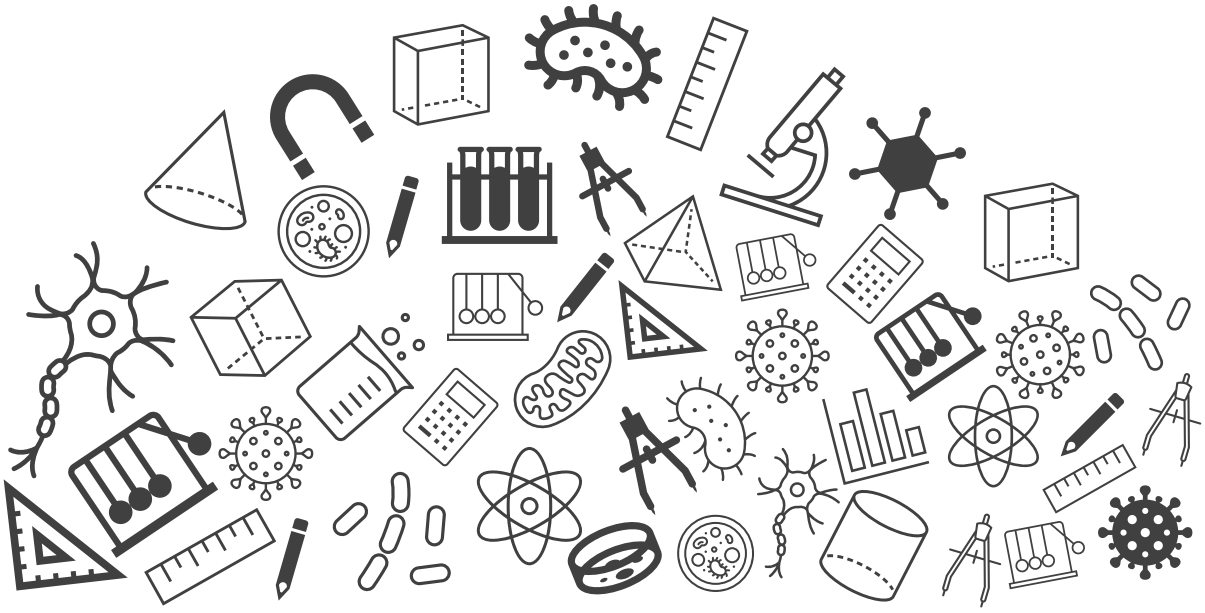
Grade 09: Maths
Exam Important Questions



Linear Equations in Two Variables

Topic : Exam Important Questions

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

(i) $2x - \frac{y}{5} + 6 = 0$

(ii) $\frac{x}{5} - \frac{y}{6} = 1$

(iii) $\sqrt{2}x + \sqrt{3}y = 5$

[3 Marks]

(i) $2x - \frac{y}{5} + 6 = 0$

$ax + by + c = 0$

$a = 2, b = -\frac{1}{5}, c = 6$

[1 Mark]

(ii) $\frac{x}{5} - \frac{y}{6} = 1$

$\frac{x}{5} - \frac{y}{6} - 1 = 0$

$ax + by + c = 0$

$a = \frac{1}{5}, b = -\frac{1}{6}, c = -1$

[1 Mark]

(iii) $\sqrt{2}x + \sqrt{3}y = 5$

$\sqrt{2}x + \sqrt{3}y - 5 = 0$

$ax + by + c = 0$

$a = \sqrt{2}, b = \sqrt{3}, c = -5$

[1 Mark]

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

[3 marks]

Let the cost of a notebook be = ₹ x

Let the cost of a pen be = ₹ y ----------[1 mark]

According to the question,

The cost of a notebook is twice the cost of a pen.

i.e., Cost of a notebook = 2 × Cost of a pen ----------[1 mark]

x = 2 × y

x = 2y

x - 2y = 0

x - 2y = 0, is the linear equation in two variables to represent the statement ‘The cost of a notebook is twice the cost of a pen’. ----------[1 mark]

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

(i) 3x - y = x - 1

(ii) $\frac{x}{2}-\frac{y}{3}=\frac{1}{6}+y$

[2 Marks]

(i) 3x – y = x – 1

In the form of ax + by + c = 0 we have 2x + (-1y) + 1 = 0 where a = 2, b = -1 and c = 1

[1 Mark]

(ii) $\frac{x}{2}-\frac{y}{3}=\frac{1}{6}+y$

$Multiply\ throughout\ with\ 6$

$3x-2y=1+6y$

$\Rightarrow 3x-8y+(-1)=0$

$ax+by+c=0$

$a=3, b=-8, c=-1$

[1 Mark]

4. Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b and c in each case:

(i) $3x = -7y$ (ii) $y - 5 = 0$

(iii) $4 = 3x$

[3 Marks]

(i) $3x = -7y$

$\Rightarrow\ 3x + 7y + 0 = 0$

Here $a = 3,\ b = 7,\ c = 0$
Here $a = 2,\ b = 0,\ c = 3$

[1 Mark]

(ii) $y - 5 = 0$

$\Rightarrow\ 0x + y - 5 = 0$

Here $a = 0,\ b = 1,\ c = -5$

[1 Mark]

(iii) $4 = 3x$

$\Rightarrow\ 3x - 4 = 0$
$\Rightarrow\ 3x + 0y - 4 = 0$

Here $a = 3,\ b = 0,\ c = -4$

[1 Mark]

5. Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b and c in each case:

(i) $-2x + 3y = 12$ (ii) $x - \frac{y}{2} - 5 = 0$ (iii) $2x + 3y = 9.35$

[3 marks]

(i) $-2x + 3y = 12$

$\Rightarrow \quad -2x + 3y - 12 = 0$

Here $a = -2,\ b = 3,\ c = -12$

[1 mark]

(ii) $x - \frac{y}{2} - 5 = 0$

Here $a = 1,\ b = -\frac{1}{2}, c = -5$

[1 mark]

(iii) $2x + 3y = 9.35$

$\Rightarrow\ 2x + 3y - 9.35 = 0$

Here $a = 2,\ b = 3,\ c = -9.35$

[1 mark]

6. The value of y at $x = -5$ in the equation $25y = 75x$ is :

[1 Mark]

Solution:

Given equation: $25y = 75x$ .....(i)
also, $x = -5$ (given)
Putting value of $x = -5$ in equation (i) we get,
$25y = 75x$
$25y = 75(-5)$
$25y = -375$
$y = -375/25$
$y = -15$
So, the value of y is -15.
(1 Mark)

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

[2 Marks]

Solution:

Let, Total fare $= y$
Total distance covered $= x$
Given
Fair for the subsequent distance after 1st kilometer $=$ ₹5
Fair for 1st kilometer $=$ ₹8
[1 Mark]

According to question statement,
$y = 8 + 5(x - 1)$
$\Rightarrow y = 8 + 5x - 5$
$\Rightarrow y = 5x + 3$
[1 Mark]

8. Write four solutions for each of the following equations:

(i) $3x + 4y = 7$

(ii) $x + \pi y = 4$

[4 marks]

Solution:

(i) $3x + 4y = 7$
$\therefore y = (7 - 3x)/4$
When $x = 0$, then
$y = (7 - 3 \times 0)/4$
$y = 7/4$
Similarly, for $x = 1, 2$, and 3, we get value of y as $1, 1/4$, and $-1/2$ respectively. Hence, four solutions for equation $3x + 4y = 7$ are $(0, 7/4), (1, 1), (2, 1/4), (3, -1/2)$.
[2 marks]

(ii) $x + \pi y = 4$
$\therefore y = (x - 4)/\pi$
When $x = 0$, then
$y = (0 - 4)/\pi$
$y = -4/\pi$
Similarly, for $x = 1, 2$, and 3, we get value of y as $-3/\pi, -2/\pi$, and $-1/\pi$ respectively.
Hence, four solutions for equation $x + \pi y = 4$ are $(0, -4/\pi), (1, -3/\pi), (2, -2/\pi), (3, -1/\pi)$.
[2 marks]

9. Find the value of p if $x = 3, y = -4$ is a solution of the equation $4x + 2py = 28$.

[2 marks]

Solution:

Given equation is $4x + 2py = 28$.
Putting the values of x and y in the equation, we have
$4x + 2py = 28$
$\implies 4 \times 3 + 2p \times (-4) = 28$
[1 mark]

$\implies 4 \times 3 + 2p \times (-4) = 28$
$\implies 12 - 8p = 28$
$\implies 8p = -16$
$\therefore p = -2$
[1 mark]

10. Write four solutions for each of the following equations:

(i) $y - 2x = 3$

(ii) $5x - \pi y = 5$

[4 marks]

Solution:

(i) $y - 2x = 3$
$\therefore y = 3 + 2x$
When $x = 0$, then
$y = 3 + 2 \times 0$
$y = 3$
Similarly, for $x = 1, 2$, and 3, we get value of y as $5, 7$, and 9 respectively.
Hence, four solutions for equation
$y - 2x = 3$ are $(0, 3), (1, 5), (2, 7), (3, 9)$.
[2 marks]

(ii) $5x - \pi y = 5$
$\therefore y = (5x - 5)/\pi$
When $x = 0$, then
$y = (5 \times 0 - 5)/\pi$
$y = -5/\pi$
Similarly, for $x = 1, 2,$ and $3,$ we get value of y as $0, 5/\pi$, and $10/\pi$ respectively.
Hence, four solutions for equation $5x - \pi y = 5$ are
$(0, -5/\pi), (1, 0), (2, 5/\pi), (3, 10/\pi)$.
[2 marks]