CBSE Test Paper 02

CH-4 Linear Equations in Two Variables

1. If (-2, 5) is a solution of 2x + my = 11, then the value of 'm' is
   a. -2
   b. 2
   c. 3
   d. -3
2. Any point on the y-axis is of the form
   a. (x, y)
   b. none of these
   c. (y, 0)
   d. (0, y)
3. The point of the form (a, a), where a lies on
   a. the x-axis
   b. the line y = x
   c. the y-axis
   d. the line x + y = 0
4. The point of the form (-a, a), where a lies on
   a. the line x + y = 02
   b. the y-axis
   c. the x-axis
   d. the line y = x
5. The equation x = 7 in two variables can be written as
   a. 1.x + 1.y = 7
   b. 1.x + 0.y = 7
   c. 0.x + 1.y = 7
   d. 0.x + 0.y = 7
6. Fill in the blanks:

   If $x = k^2$ and y = k is a solution of the equation x - 5y + 6 = 0, then the values of k is _____.

7. Fill in the blanks:

   $2x = -5y$ in the form of $ax + by + c = 0$ is _____.

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

9. Linear equation $x - 2 = 0$ is parallel to which axis?

10. Solve the following equation for x: $(5x + 1)(x + 3) - 8 = 5(x + 1)(x + 2)$

11. If the length of a rectangle is decreased by 3 units and breadth increased by 4 unit, then the area will increase by 9 sq. units. Represent this situation as a linear equation in two variables.

12. Draw the graph of each of the line a equations in two variables: $y = 3x$.

13. For what value of c, the linear equation $2x + cy = 8$ has equal values of x and y for its solution?

14. Draw the graph of the following equation. Read a few solutions from the graph and verify the same by actual substitution and find the points where the line meets the two axes. $y – 3x = 9$

15. Draw the graph of the equation $y - x = 2$.

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Solution

1. (c) 3

   Explanation:

   If (-2, 5) is a solution of 2x + my = 11

   then it will satisfy the given equation

   2 .(-2)+5 m=11

   -4+5 m=11

   5 m=11+4

   5 m=15

   $m = \frac{15}{5} = 3$

   m=3

2. (d) (0, y)

   Explanation: at y axis the value of x co-ordinate is zero

3. (b) the line y = x

   Explanation: The point (a ,a) lies on line x = y or x-y =0

   here is the verification

   Put x = a in equation

   x-y =0

   a-y = 0

   -y = -a

   y = a

   hence it is prove that (a,a) is a solution of x- y =0 or x = y

4. (a) the line x + y = 0

   Explanation: The point (a ,-a) lies on line x+y =0

   here is the verification

   Put x = a in equation

   x+y =0

   a+y=0

y = -a

hence it is prove that (a,-a) is a solution of x+y =0

5. (b) 1.x + 0.y = 7

   Explanation: The equation x = 7 in two variables can be written as exactly 1.x + 0.y = 7

   because it contain two variable x and y and coefficient of y is zero as there is no term containing y in equation x = 7

6. 2, 3

7. 2x + 5y = 0

8. It is given that (2, -2) is a solution of the equation 5x + ky = 4.

   $\therefore$ 5 $\times$ 2 + k $\times$ (-2) = 4

   $\Rightarrow$ 10 - 2k = 4

   $\Rightarrow$ -2k = 4 - 10

   $\Rightarrow$ -2k = -6

   $\Rightarrow$ k = $\frac{6}{2}$

   $\Rightarrow$ k = 3

9. Here, linear equation is x - 2 = 0 $\Rightarrow$ x = 2

10. According to the question, given equation is

    $(5x + 1)(x + 3) - 8 = 5(x + 1)(x + 2).$

    $\Rightarrow \left(5x^2 + 15x + x + 3\right) - 8 = 5\left(x^2 + 2x + x + 2\right)$

    $\Rightarrow \ 5x^2 + 16x + 3 - 8 = 5\left(x^2 + 3x + 2\right)$

    $\Rightarrow 5x^2 + 16x - 5 = 5x^2 + 15x + 10$

    $\Rightarrow 16x - 15x = 15$

    $\Rightarrow \ x = 15$

11. Let the length be x and breadth be y.

    $\therefore$ Area of the rectangle $= xy$

    When length is $x - 3$ and breadth is $y + 4$, then the area will increase by 9 sq. units

    $\therefore (x - 3)(y + 4) = xy + 9$

    $\Rightarrow xy + 4x - 3y - 12 = xy + 9$

    $\Rightarrow 4x - 3y - 12 = 9$

$\Rightarrow 4x - 3y = 21$

12. y=3x

    if $x = 0 \Rightarrow y = 0$

    $x = 1 \Rightarrow y = 3$

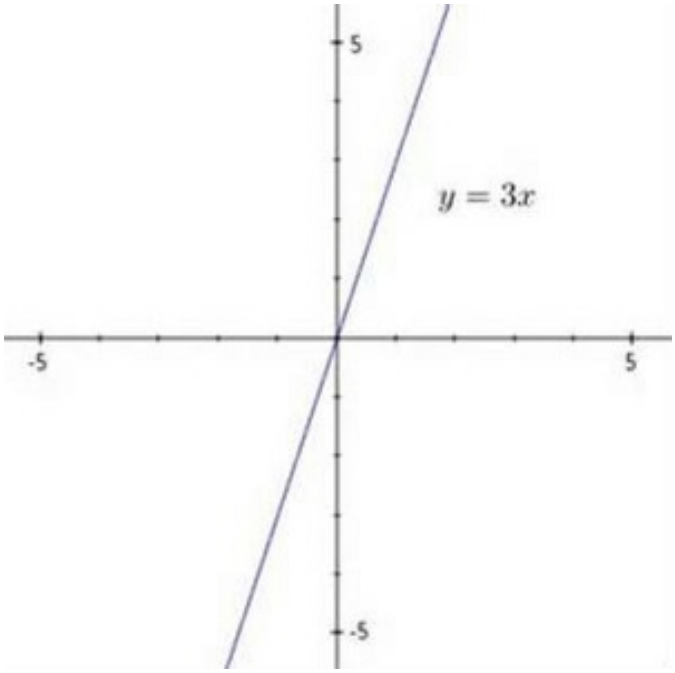
    $x = 2 \Rightarrow y = 6$

    x = 0, y = 0; x = 1, y = 3 and x = 2, y = 6

    are the solutions of the linear equation y = 3x.

    We can optionally consider the given below table for plotting the linear equation y = 3x on the graph.

X	0	1	2
y	0	3	6



13. The value of c for which the linear equation 2x + cy = 8 has equal values of x and y i.e., x = y for its solution is

    2x + cy = 8 $\Rightarrow$ 2x + cx = 8 [$\because$ y = x]

    $\Rightarrow$ cx = 8 - 2x

    $\therefore\ c = \frac{8-2x}{x}, x \neq 0$

14. y - 3x = 9

    $\Rightarrow$ y = 3x + 9

x	-2	-3
y	3	0

We plot the points(-2, 3) and (-3, 0) on the graph paper and join the same by a ruler to get the line which is the graph of the equation y - 3x = 9.

Few solutions read from the graph are

(0, 9), (-1, 6) and (-4, -3)

For (0, 9)

L.H.S. = 9 - 3(0) = 9- 0 = 9 = R.H.S.

∴The solution (0, 9) is verified.

For (-1, 6)

L.H.S. = 6 - 3(-1) = 6 +3 = 9

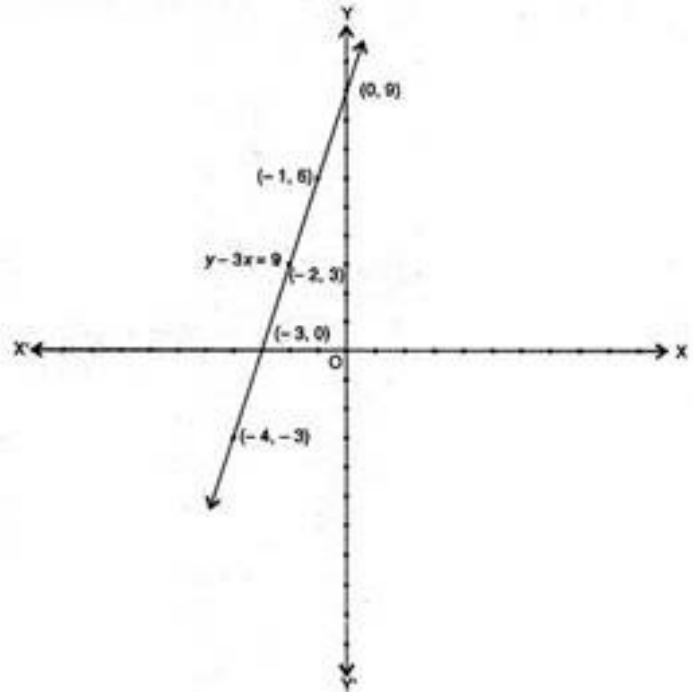
∴ The solution (-1, 6) is verified.

For (-4, -3)

L.H.S. = -3 - 3(-4) = -3 + 12 = 9 = R.H.S.

∴ The solution (-4, -3) is verified.

The points where the given line meets the x-axis and the y-axis are respectively (-3, 0) and (0, 9) respectively.



15. Given linear equation can be written as y = 2 + x ...(i)

When x = - 2, then from Eq. (i), we get y = 2 - 2 = 0

When x = 0, then from Eq. (i), we get y = 2

When x = 1, then from Eq. (i), we get y = 2 + 1 = 3

Thus, we get the table

x	0	- 2	1
y	2	0	3

Draw the coordinate axes XOX' and YOY', and plot the points A (- 2,0), B (0, 2) and C (1, 3) by taking a suitable scale. On joining the points A, B and C, we get a straight line AC. Thus, the line AC represents the required graph of the given linear equation in two variables.