CBSE Test Paper 03

CH-4 Linear Equations in Two Variables

1. 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)
2. Which of the following pair is a solution of the equation 3x – 2y = 7?
   a. (-2, 1)
   b. (1, -2)
   c. (5, 1)
   d. (1, 5)
3. The graph of the linear equation 3x – 2y = 6, cuts the x-axis at the point
   a. (0, -2)
   b. (-2, 0)
   c. (2, 0)
   d. (0, 2)
4. Express ‘y’ in terms of ‘x’ in the equation 5y – 3x – 10 = 0.
   a. $y = \frac{3-10x}{5}$
   b. $y = \frac{3+10x}{5}$
   c. $y = \frac{3x-10}{5}$

d. $y = \frac{3x+10}{5}$

5. The graph of the line x = -2 passes through

   a. (3, -2)

   b. (-2, 3)

   c. (0, 4)

   d. (-1, 4)

6. Fill in the blanks:

   Any point on the X-axis is of the form of _____.

7. Fill in the blanks:

   The equation x = 7, in two variables can be written as _____.

8. Is (x, 0) a point on the x-axis? Give reason.

9. Express the given statement in the form of a linear equation in two variables:
   The cost of a half dozen eggs is the same as the cost of one packet bread.

10. Express x in terms of y for the linear equation $\frac{2}{3}$x + 4y = -7.

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

12. Give the geometric representation of y = 3 as an equation

    i. In one variable,
    ii. In two variables

13. Find four solutions for the following equation: 12x + 5y = 0

14. Find four solutions for the following equation :5x – 3y = 0

15. Draw the graphs of 2x + y = 6 and 2x - y + 2 = 0. Shade the region bounded by these lines and x-axis.

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Solution

1. (c) (-3 , 0)

   Explanation: 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)

2. (b) (1, -2)

   Explanation: solution of the equation 3x – 2y = 7

   is (1,-2) as it satisfy the given equation

   3x – 2y = 7

   => 3(1) - 2(-2) = 7

   => 3+4=7

   LHS = RHS

3. (c) (2, 0)

   Explanation:

   the linear equation 3x – 2y = 6, cuts the x-axis

   when y co-ordinate is 0

   so we put y = 0 in given equation 3x – 2y = 6

   3x - 2.0 = 6

   3x = 6

   $x = \frac{6}{3}$

   x=2

so the co-ordinates are (2,0)

4. (d) $y = \frac{3x+10}{5}$
   Explanation:

   5 y-3 x-10=0

   5 y-3 x=10

   5 y=10+3 x

   $y = \frac{10+3x}{5}$

5. (b) (-2, 3)
   Explanation: because value of x -co-ordinate is - 2

6. (x, 0)

7. 1 x + 0 y = 7

8. Yes, the point (x,0) lies on x-axis because the coordinate of any point on x-axis is zero.

9. Let the cost of one egg be Rs. x and cost of one packet bread is Rs. y.
   6x = y

10. According to the question, given equation is $\frac{2}{3}x + 4y = -7$
    $\Rightarrow \frac{2}{3}x = -7 - 4y$
    $\Rightarrow 2x = 3(-7 - 4y)$
    $\Rightarrow x = \frac{-21-12y}{2}$

11. Given equation is:
    x - 5y + 6 = 0 ... (1)

    It is given that x = k^2 and y = k is a solution of the equation x - 5y + 6 = 0.

    On putting the corresponding value of x and y in (1), we get

    k^2 - 5k + 6 = 0

    ⇒ k^2 - 3k - 2k + 6 = 0

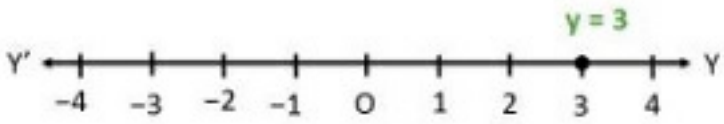
    ⇒ k(k - 3) -2(k - 3) = 0

    ⇒ (k - 2)(k - 3) = 0

    ⇒ k = 2 or 3

12. We need to represent the linear equation $y = 3$
geometrically in one variable.

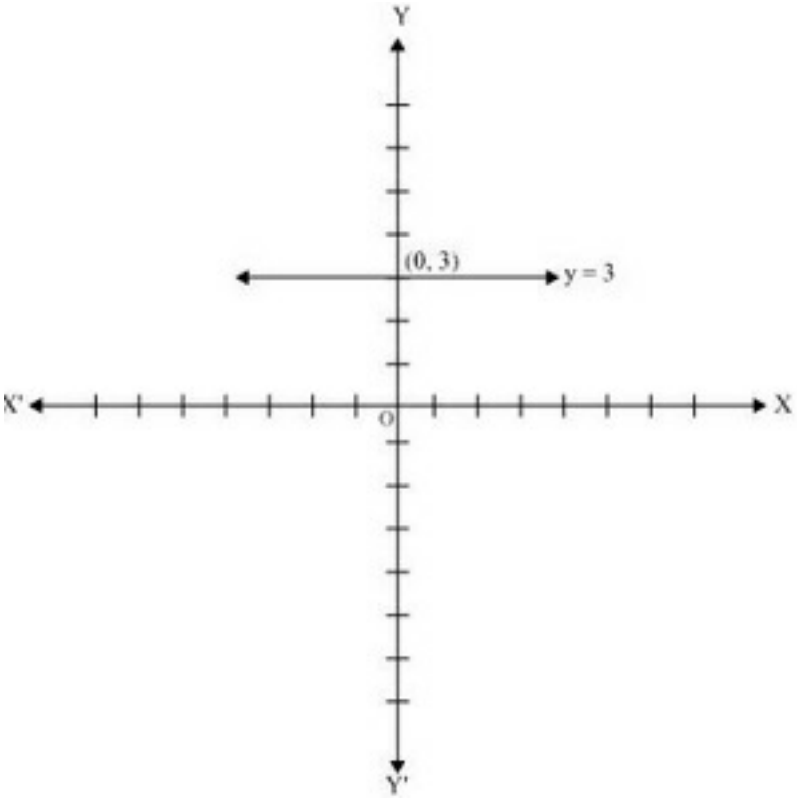
    i. We can conclude that in one variable, the geometric representation of the linear equation $y = 3$
    will be same as representing the number 3 on a number line.



    geometrically in two variables.
    We know that the linear equation y = 3 can also be written as $x + y = 3$.

    ii. We can conclude that in two variables, the geometric representation of the linear equation $y = 3$
    will be same as representing the graph of linear equation $x + y = 3$.
    Given below is the representation of the linear equation $x + y = 3$ on a graph.
    We can optionally consider the given below table for plotting the linear equation $0 \cdot x + y = 3$on the graph.

X	1	0
y	3	3



13. 12x + 5y = 0

    ⇒ 5y = –12x

    ⇒ $y = \frac{-12}{5}x$

    Put x = 0, then $y = \frac{-12}{5}(0) = 0$

    Put x = 5, then $y = \frac{-12}{5}(5) = -12$

    Put x = 10, then $y = \frac{-12}{5}(10) = -24$

    Put x = 15, then $y = \frac{-12}{5}(15) = -36$

    ∴ (0, 0), (5, –12), (10, –24) and (15, –36) are the four solutions of the equation 12x + 5y = 0

14. 5x – 3y = 0

    ⇒ 3y = 5x

    ⇒ $y = \frac{5}{3}x$

    Put x = 0, then $y = \frac{5}{3}(0) = 0$

    Put x = 3, then $y = \frac{5}{3}(3) = 5$

    Put x = 6, then $y = \frac{5}{3}(6) = 10$

    Put x = 9, then $y = \frac{5}{3}(9) = 15$

    ∴ (0, 0), (3, 5), (6, 10) and (9, 15) are the four solutions of the equation 5x – 3y = 0.

15. We have,

    $2x + y = 6$ ....(i)

    and $2x - y = 2 = 0$ ....(ii)

    Graph of the equation $2x + y = 6$

    We have,

    $2x + y = 6 \Rightarrow y = 6 - 2x$

    When $x = 0$, we have $y = 6$

    When $x = 3$, we have $y = 0$

    Thus, we have the following table giving two points on the line represented by the equation $2x + y = 6$

x	0	3
y	6	0

    Plotting the points A (0,6) and B(3,0) on the graph paper on a suitable scale and drawing a line joining them, we obtain the graph of the line represented by the equation $2x + y = 6$.

    Graph of the equation $2x - y + 2 = 0$:

    We have,

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

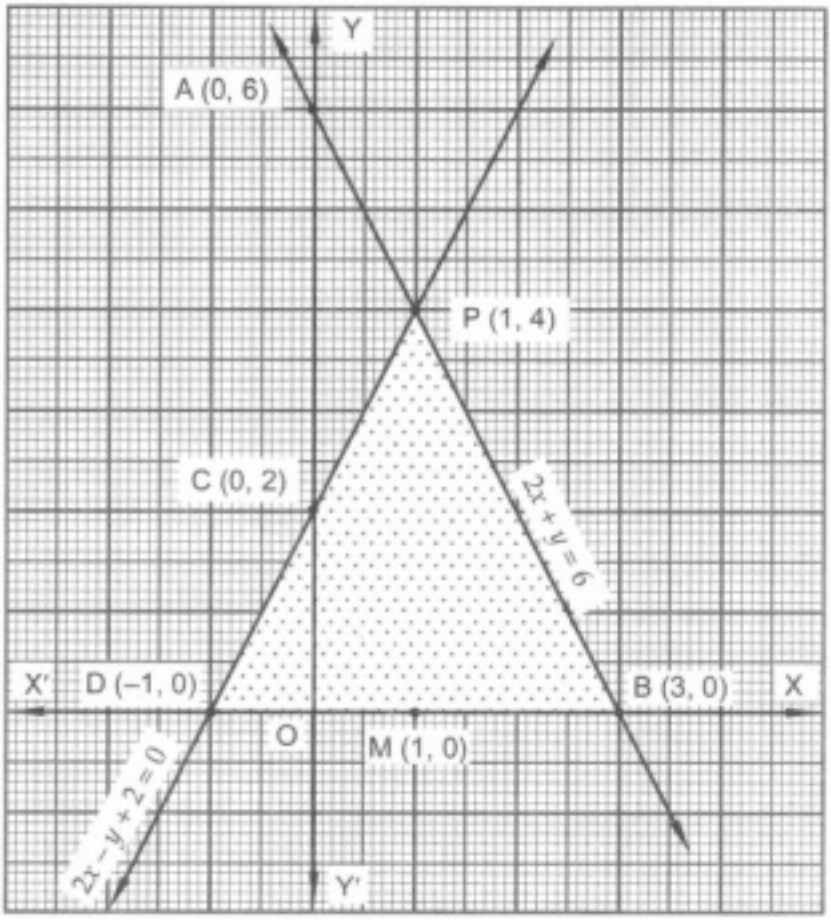
    When $x = 0$, we have $y = 2$

    When $x = - 1$, we have $y = 0$

    Thus, we have the following table giving two points on the line representing the given equation

x	0	- 1
y	2	0

    Plotting the points C(0,2) and D (-1, 0) on the same graph paper and joining them, we obtain the graph of the line represented by the equation $2x - y + 2 = 0$.



The region bounded by these lines and x-axis is shown in the graph.