CBSE Test Paper 04

CH-4 Linear Equations in Two Variables

1. The point on the graph of the linear equation 2x + 5y = 19, whose ordinate is 1½ times its abscissa is
   a. (-2, -3)
   b. (2, 3)
   c. none of these
   d. (4, 6)
2. The line represented by the equation x + y = 16 passes through (2, 14). How many more lines pass through the point (2, 14)
   a. 10
   b. 2
   c. many
   d. 100
3. The point which lies on x-axis at a distance of 4 units in the negative direction of x-axis is
   a. (0, -4)
   b. (-4, 0)
   c. (4, 0)
   d. (0, 4)
4. y = 0 is the equation of
   a. y-axis
   b. a line parallel to y-axis
   c. x-axis
   d. a line parallel to x-axis
5. Write the linear equation such that each point on its graph has an ordinate 5 times its abscissa.
   a. y = 5x
   b. none of these
   c. 5x + y = 2
   d. x = 5y

6. Fill in the blanks:

   If the point (3, 4) lies on the graph of the equation 3y - ax - 7 = 0, then the value of a is _____.

7. Fill in the blanks:

   The positive solutions of the equation ax + by + c = 0 always lies in _____ quadrant.

8. Express the given statement in the form of a linear equation in two variables. The sum of the ordinate and abscissa of a point is 6.

9. The diagonals of a quadrilateral are equal. Is it necessarily a parallelogram?

10. Find whether $(\sqrt{2}, 4\sqrt{2})$ is the solution of the equation x – 2y = 4 or not?

11. Find whether (2, 0) is the solution of the equation x – 2y = 4 or not ?

12. Find the value of the following equation for x = l, y = l as a solution. 5x + 3y = a

13. Write two solutions of the form x = 0, y = a and x = b, y = 0 for each of the following equation: 5x - 2y = 10

14. Draw the graph of the following equation and check whether :

    i. x = 2, y = 5
    ii. x = –1, y = 3

    are the solutions: 2x + 5y = 13

15. Ravish tells his daughter Aarushi, "Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be". If present ages of Aarushi and Ravish are x and y years respectively, represent this situation algebraically as well as graphically.

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Solution

1. (b) (2, 3)

   Explanation: Ordinate means y-coordinate. It means we need to find a point on the given line where y-coordinte = 3/2 (x-coordinate) . Just put y = [(3/2) .x] in the given eqn.

   $2x + 5 \cdot \frac{3}{2}x = 19$
   $2x + \frac{15}{2}x = 19$
   $\frac{4x+15x}{2} = 19$
   $\frac{19x}{2} = 19$
   $x = \frac{19\times 2}{19}$
   $y = \frac{3}{2}x$
   $y = \frac{3}{2} \times 2$
   y=3

   so the co-ordinate are (2,3)

2. (c) many

   Explanation: There are many lines pass through the point (2, 14)

   for example

   x - y = -12

   2x + y =18

   and many more

3. (b) (-4, 0)

   Explanation: at x axis the value of y co-ordinate is 0

   x-axis at a distance of 4 units in the negative direction so the co-ordinate of x-axis is - 4

   so the co-ordinate of point is (- 4,0)

4. (c) x-axis

   Explanation: a x-intercept is a point on the graph where y is zero.

5. (a) y = 5x

   Explanation:

y = 5x

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at x = 1

y = 5.1 = 5

y = 5

(1,5)

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at x = 2

y = 5.2 = 10

y = 10

(2,10)

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at x = 3

y = 5.3 = 15

y = 15

(3,15)

6. $\frac{5}{3}$
7. 1st quadrant
8. $x + y = 6$
9. No, the diagonals of a parallelogram bisect each other but not necessarily equal.
10. x-2y=4

    Put x = $\sqrt{2}$, y = $4\sqrt{2}$ in given equation, we get

    $\sqrt{2} - 2(4\sqrt{2}) = \sqrt{2} - 8\sqrt{2} = -7\sqrt{2}$

    which is not 4.

    $\therefore (\sqrt{2}, 4\sqrt{2})$ is not a solution of given equation.
11. x-2y=4

    Put x = 2 and y = 0 in given equation, we get

x – 2y = 2 – 2(0) = 2 – 0 = 2, which is not 4.

∴ (2, 0) is not a solution of given equation.

12. 5x + 3y = a

    If x = l, y = l is a solution, then

    5l + 2al = 3a

    ⇒ 3a – 2al = 5l

    ⇒ a (3 – 2l) = 5l

    ⇒ $a = \frac{5l}{3-2l}$

13. We have,

    5x - 2y = 10 ...(i)

    Substituting x = 0 in the equation 5x - 2y = 10, we get

    5 × 0 - 2y = 10

    ⇒ y = $\frac{10}{-2}$ = -5

    Thus, x = 0 and y = -5 is a solution of 5x - 2y = 10.

    Substituting y = 0 in (i), we get

    5x - 2 × 0 = 10

    ⇒ 5x = 10

    ⇒ x = 2

    Thus, x = 2 and y = 0 is a solution of 5x - 2y = 10.

    Thus, x = 0, y = -5 and x = 2, y = 0 are two solutions of 5x - 2y = 10

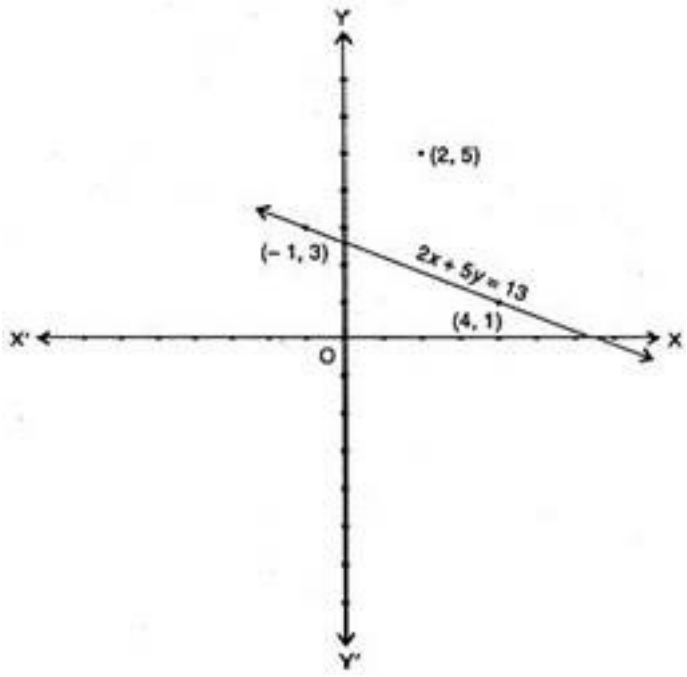
14. 2x + 5y = 13

    ⇒5y = 13– 2x

    ⇒ y = $\frac{13-2x}{5}$

x	–1	4
y	3	1

We plot the points (–1, 3) and (4, 1) on the graph paper and join the same by a ruler to get the line which is the graph of the equation 2x + 5y = 13



i. ∵The point (2, 5) does not lie on the graph

∴ x = 2, y = 5 is not a solution.

ii. ∵The point(–1, 3) lies on the graph

∴ x = –1, y = 3 is a solution.

15. The present ages of Aarushi and Ravish are x and y years respectively.

It is given that seven-year ago Ravish was seven times as old as Aarushi,

∴ 7(x - 7) = y - 7

$\Rightarrow$ 7x - 49 = y - 7

$\Rightarrow$ 7x - 42 = y ....(i)

It is also given that after three years from now Ravish shall be the three times as old as her daughter.

∴ 3(x + 3) = y + 3

$\Rightarrow$ 3x + 9 = y + 3

∴ 3x + 6 = y ....(ii)

Now,

y = 7x - 42 [Using (i)]

Putting x = 6, we get y = 7 $\times$ 6 - 42 = 0

Putting x = 5, we get y = 7 $\times$ 5 - 42 = -7

Thus, we have the following table for the points on the line 7x - 42 = y:

x	6	5
y	0	-7

We have,

y = 3x + 6 [Using (ii)]

Putting x = -2, we get y = 3 × (-2) + 6 = 0

Putting x = -1, we get y = 3 × (-1) + 6 = 3

Thus, we have the following table for the points on the line y = 3x + 6:

x	-1	-2
y	3	0

The graphs of the both linear equations are: