LINEAR EQUATIONS IN TWO VARIABLES

1.Intoduction:

In earlier classes, you have studied linear equations in one variable. Can you write down a linear equation in one variable? You may say that x + 1 = 0, x + 2 = 0 and 2 y + 3 = 0 are examples of linear equations in one variable. You also know that such equations have a unique (i.e., one and only one) solution.

2.Notes:

- An equation of the form ax + by + c = 0, where a, b and c are real numbers, such that a and b are not both zero, is called a linear equation in two variables.
- 2. A linear equation in two variables has infinitely many solutions.
- The graph of every linear equation in two variables is a straight line.
- x = 0 is the equation of the y-axis and y = 0 is the equation of the x-axis.
- The graph of x = a is a straight line parallel to the y-axis.
- The graph of y = a is a straight line parallel to the x-axis

3.Example sums:

*Write each of the following as an equation in two variables: (i) x = –5 (ii) y = 2 (iii) 2x = 3 (iv) 5y = 2 .

Solution : (i) x = –5 can be written as 1.x + 0.y = –5, or 1.x + 0.y + 5 = 0. (ii) y = 2 can be written as 0.x + 1.y = 2, or 0.x + 1.y – 2 = 0. (iii) 2x = 3 can be written as 2x + 0.y – 3 = 0. (iv) 5y = 2 can be written as 0.x + 5y – 2 = 0.

* Find four different solutions of the equation x + 2y = 6.

Solution : By inspection, x = 2, y = 2 is a solution because for x = 2, y = 2 x + 2y = 2 + 4 = 6 Now, let us choose x = 0. With this value of x, the given equation reduces to 2y = 6 which has the unique solution y = 3. So x = 0, y = 3 is also a solution of x + 2y = 6. Similarly, taking y = 0, the given equation reduces to x = 6. So, x = 6, y = 0 is a solution of x + 2y = 6 as well. Finally, let us take y = 1. The given equation now reduces to x + 2 = 6, whose solution is given by x = 4. Therefore, (4, 1) is also a solution of the given equation. So four of the infinitely many solutions of the given equation are: (2, 2), (0, 3), (6, 0) and (4, 1).

4.Practice sums:

* Write four solutions for each of the following equations: (i) 2x + y = 7 (ii) πx + y = 9 (iii) x = 4y 3.

*Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y.) Draw the graph of the same.