COORDINATE GEOMETRY

1. Introduction :

You have already studied how to locate a point on a number line. You also know how to describe the position of a point on the line. There are many other situations, in which to find a point we are required to describe its position with reference to more than one line.

2.Notes:

- In case of seating plan, we require the number of the column and that of the row. This simple idea has far reaching consequences, and has given rise to a very important branch of Mathematics known as Coordinate Geometry.
- The point where X'X and Y'Y cross is called the origin, and is denoted by O. Since the positive numbers lie on the directions OX and OY, OX and OY are called the positive directions of the x - axis and the y - axis, respectively. Similarly, OX' and OY' are called the negative directions of the x - axis and the y - axis, respectively.
- If $x \neq y$, then $(x, y) \neq (y, x)$, and $(x, y) = (y, x)$, if $x = y$.

3.Example sums:

* Plot the following ordered pairs of number (x, y) as points in the Cartesian plane. Use the scale 1cm = 1 unit on the axes.

Solution: The pairs of numbers given in the table can be represented by the points (– 3, 7), (0, –3.5), (– 1, – 3), (4, 4) and (2, – 3).

* Locate the points (5, 0), (0, 5), (2, 5), (5, 2), (–3, 5), (–3, –5), (5, –3) and (6, 1) in the Cartesian plane.

Solution : Taking 1cm = 1unit, we draw the x - axis and the y - axis. The positions of the points are shown by dots .

4.Practice sums:

* Write the answer of each of the following questions: (i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane? (ii) What is the name of each part of the plane formed by these two lines? (iii) Write the name of the point where these two lines intersect.

*1. In which quadrant or on which axis do each of the points (– 2, 4), (3, – 1), (– 1, 0), (1, 2) and (– 3, – 5) lie? Verify your answer by locating them on the Cartesian plane.