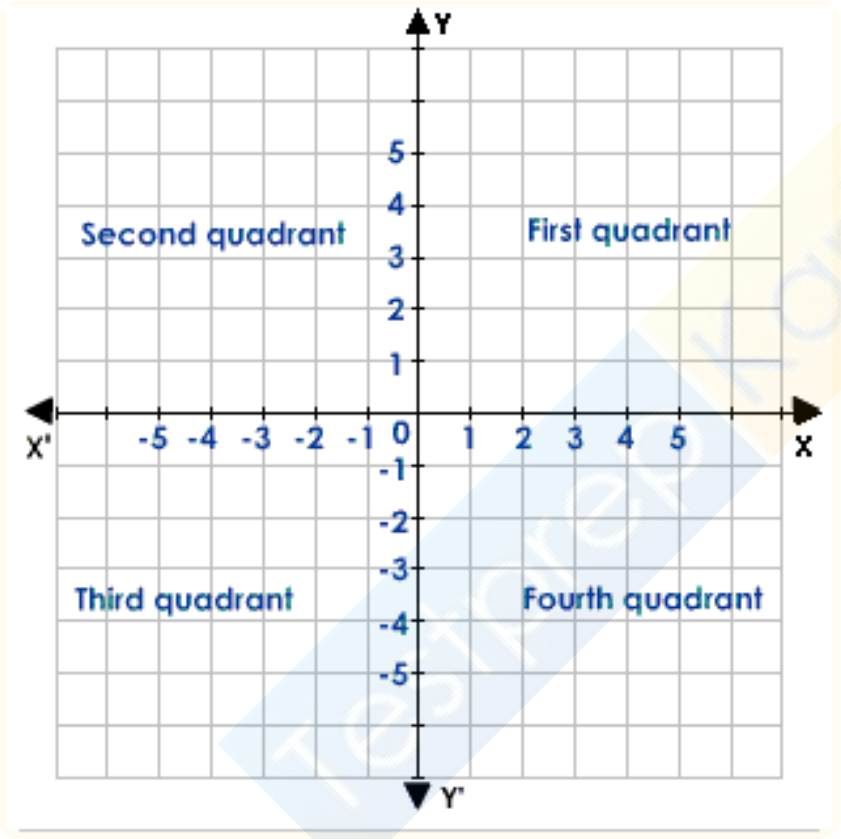
Coordinate Geometry

Coordinate geometry is that branch of mathematics which unifies algebra with geometry. We describe here many geometrical relationships with the help of algebra.

Coordinate Axes

If a pair of perpendicular lines XOX' and YOY' intersect at O, then these lines can be called co-ordinate axes. The axes divide the plane into four quadrants.

The plane containing the axes is called the Cartesian Plane.



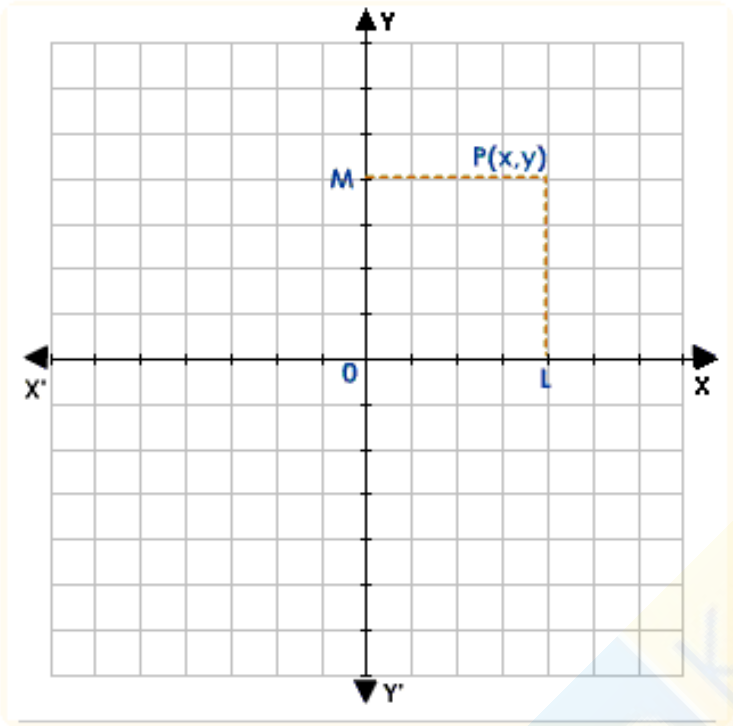
The lines XOX' and YOY' are usually drawn horizontally and vertically and are known as x-axis and y-axis respectively. The point of intersection of axes the point O is called 'the origin'. Values of x are measured from O along the x-axis and are called abscissae. The values of x are positive along OX and negative along OX' as shown in the figure.

Similarly, the values of y are measured from O along the axis of y and are called ordinates. The values of y are positive along OY and negative along OY' as shown in the figure.

The abscissa and ordinate of a point taken together are called its coordinates.

For example, if the abscissa of a point is 3 and ordinate is 5, then the co-ordinates of the point are written as (3, 5).

To plot a point



Suppose P is any point in the plane. Draw PL $\perp$ XOX' and PM $\perp$ YOY'. Let OL = x and OM = y, then the ordered pair (x, y) is said to define the point P.
Also x and y are called Cartesian coordinates of P.
Thus we find that to each point in the plane, we can associate an ordered pair (x, y) of real numbers.
Conversely, given an ordered pair of numbers, we can plot the point in the plane.