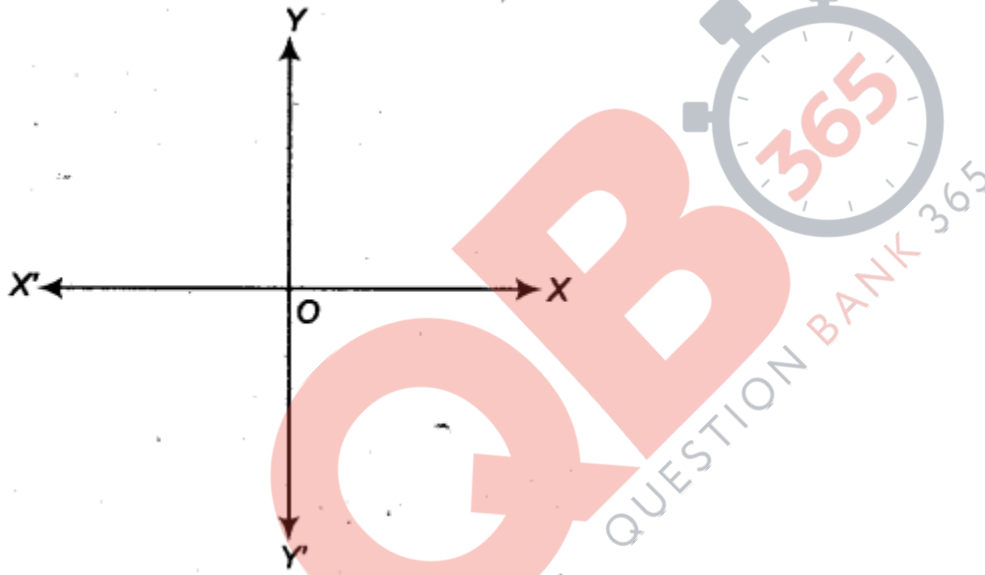# 9th Standard-Maths

Coordinate Geometry

1. **Cartesian System:** The system used to describe the position of a point in a plane is called the cartesian system.

In a cartesian system, there are two perpendicular lines and a point is located by referring them. The horizontal line XX' is called X-axis and vertical line YY' is called Y-axis.

The point where these lines intersect each other is called origin and is denoted by 'O'. OX and OY are called positive directions while OX' and OY' are called negative directions. These axes divide the plane into four parts.

These four parts are called the quadrants (one-fourth part) numbered I, II, III and IV anti-clockwise from OX. So, the plane consists of these axes and these quadrants are called the cartesian plane or the coordinate plane or the XY-plane. These axes are called the coordinate axes.
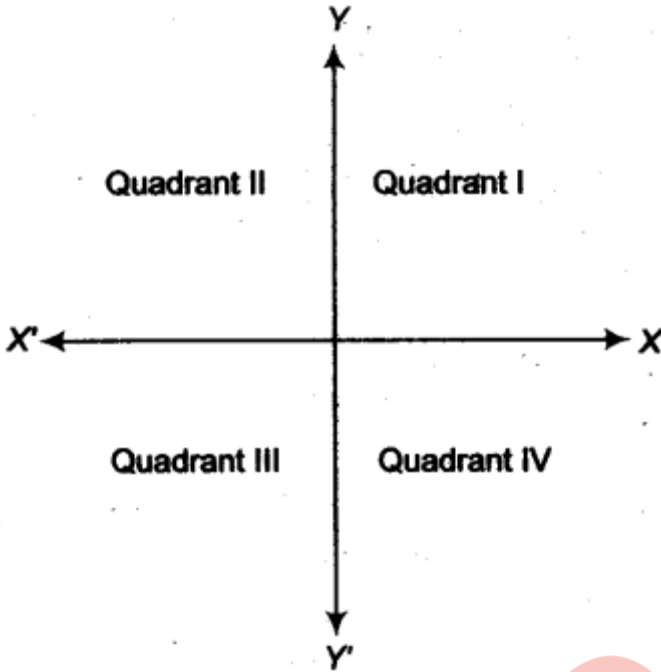
The coordinates of a point are written by using the following conventions

(i) The x-coordinate of a point is its perpendicular distance from the Y-axis measured along the X-axis (positive along the positive direction of the X-axis and negative along the negative direction of the X-axis). The x-coordinate is also called the abscissa.

(ii) The Y-coordinates of a point is its perpendicular distance from the X-axis measured along the Y-axis (positive along the positive direction of the Y-axis and negative along the negative direction of the Y-axis). The Y-coordinate is also called the ordinate.

(iii) In stating the coordinates of a point in the coordinate plane, the x-coordinate comes first and then the Y-coordinate. We place the coordinates in brackets.

2. The relationship between the Signs of the Coordinates of a Point and the Quadrant in which It Lies

(i) If a point is in the 1st quadrant, then the point will be in the form (+, +), since the 1st quadrant is enclosed by the positive X-axis and the positive Y-axis.

(ii) If a point is in the IInd quadrant, then the point will be in the form (-, +), since the IInd quadrant is enclosed by the negative X-axis and the positive Y-axis.

(iii) If a point is in the IIIrd quadrant, then the point will be in the form (-, -), since the IIIrd quadrant is enclosed by the negative X-axis and the negative Y-axis.

(iv) If a point is in the IVth quadrant, then the point will be in the form (+, -), since the IVth quadrant is enclosed by the positive X-axis and the negative Y-axis (see figure).
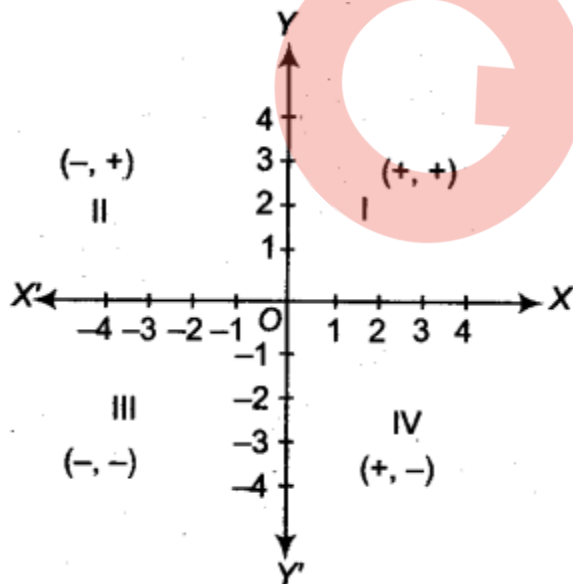
Note: The coordinates of origin O are (0, 0) because it has zero distance from both the axes, so its abscissa and ordinate both are zero.