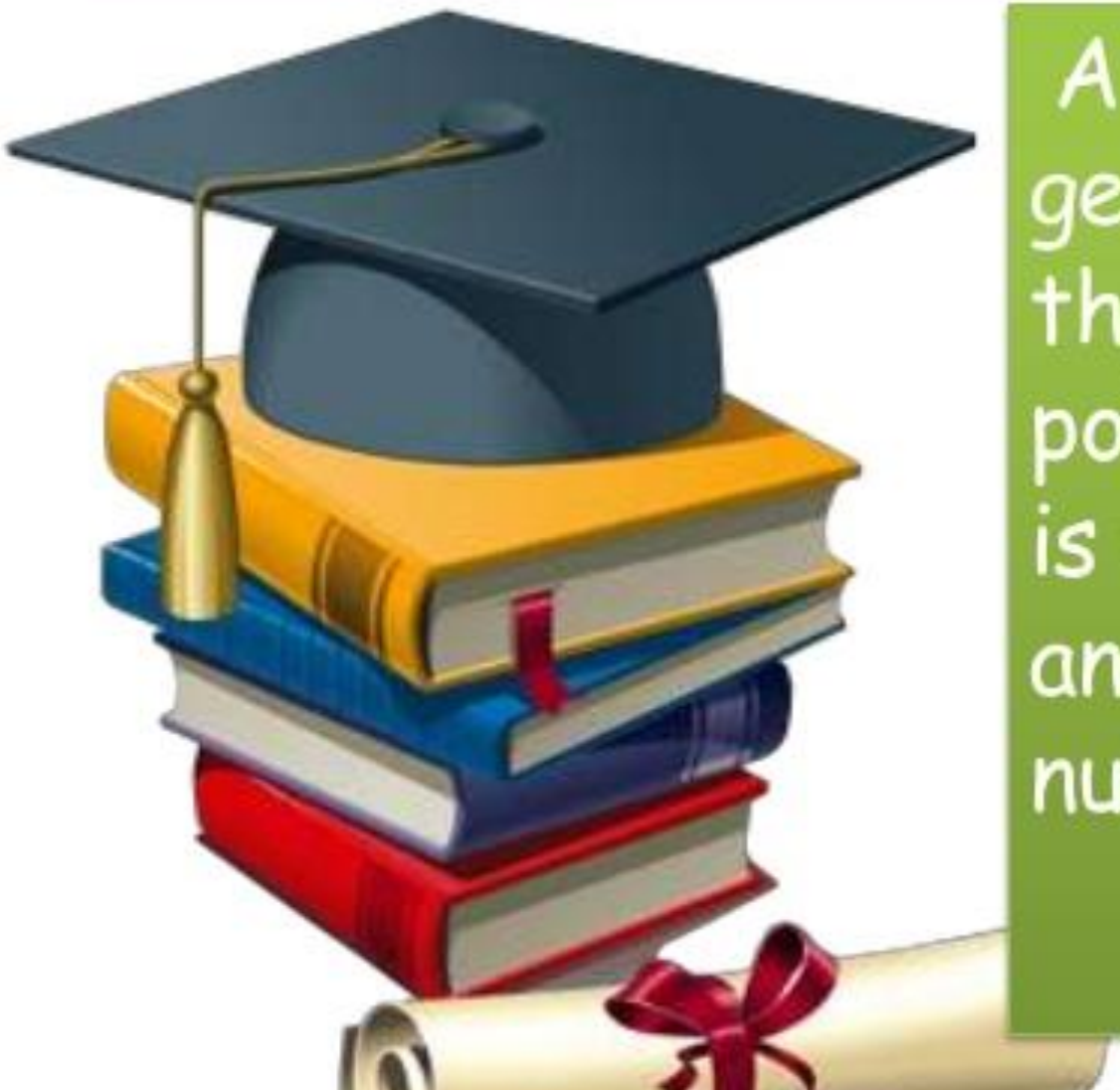
Course Title: Physical Chemistry
Course code: CHEM 5101

ELEMENTARY MATHEMATICS

(Coordinate Plane)

What is Coordinate Geometry?

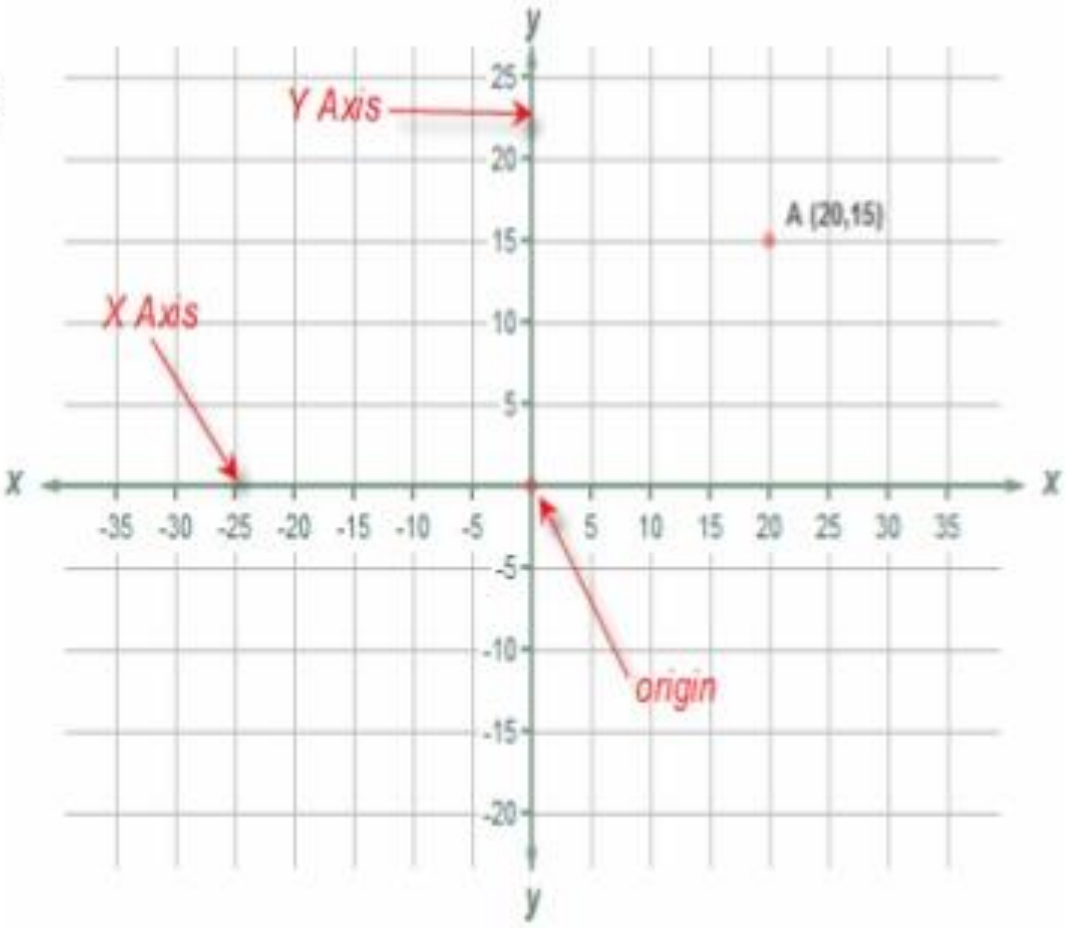


A system of geometry where the position of points on the plane is described using an ordered pair of numbers.

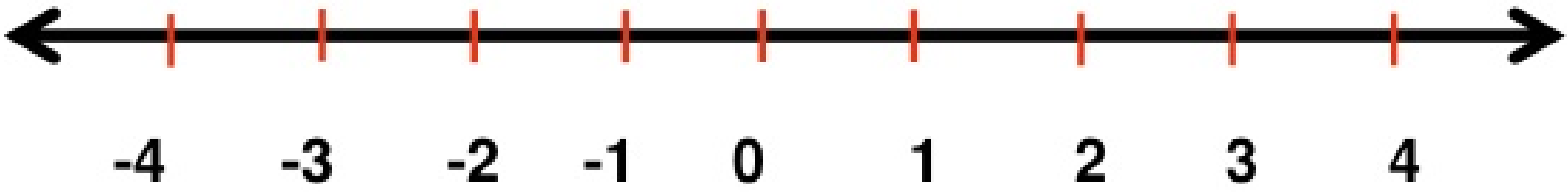
Coordinate Plane

It has two scales - one running across the plane called the "**x axis**" and another a right angles to it called the "**y axis**".

The point where the axes cross is called the "**Origin**" and is where both x and y are zero.



Review of Number Line



1. What are the parts/composition of a number line?
2. Where is zero in the number line?
3. What integers can be seen on the left side of zero? What about on the right of zero?

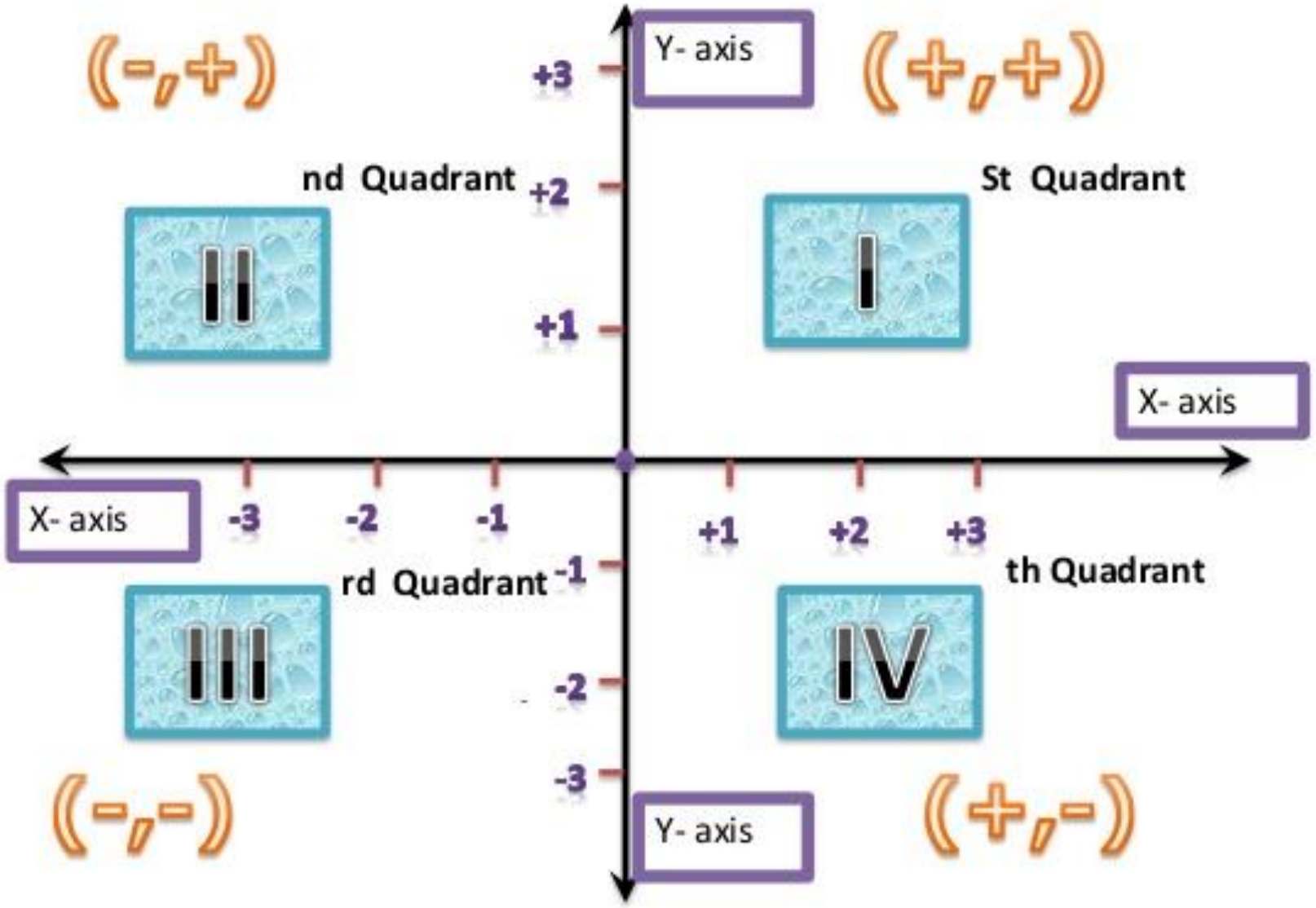
RECTANGULAR COORDINATE SYSTEM

- It is also known as xy plane or Cartesian Plane in honor of the French Mathematician Rene Descartes (1596-1650), who is known as the “Father of Modern Mathematics”.
- It is composed of two perpendicular number lines that meet at the point of origin (0,0) and divide the plane into four regions called quadrants.
- It is composed of infinitely many points. Each point in the coordinate system is defined by an ordered pair of form (x,y).
- The first coordinate of a point is called the x-coordinate or the abscissa.
- The second coordinate of a point is called the y-coordinate or the ordinate.

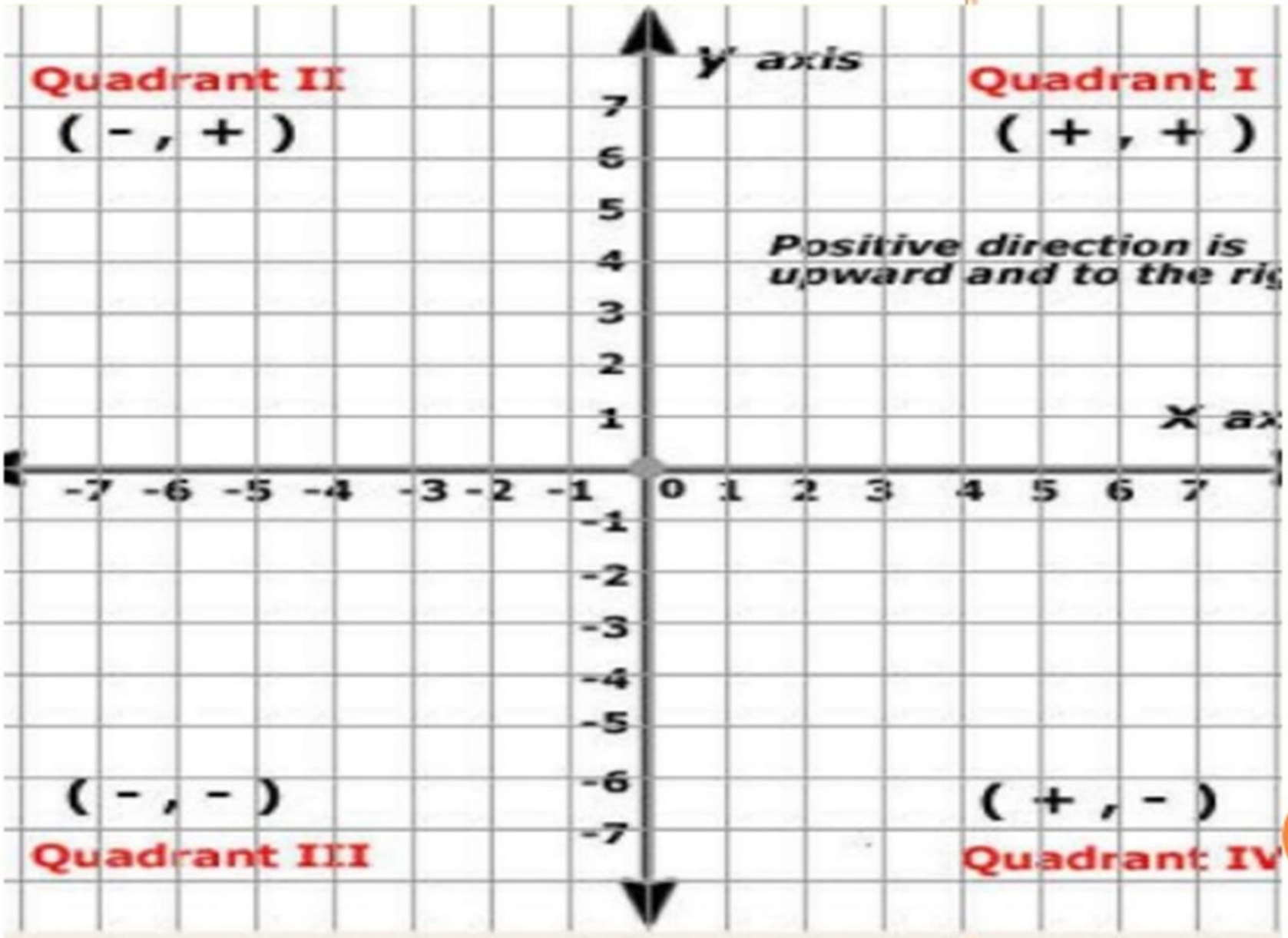
- The sign of the first and second coordinates of point vary in the four quadrants as indicated below:
  - Quadrant I (+ , +)
  - Quadrant II (- , +)
  - Quadrant III (- , -)
  - Quadrant IV (+ , -)

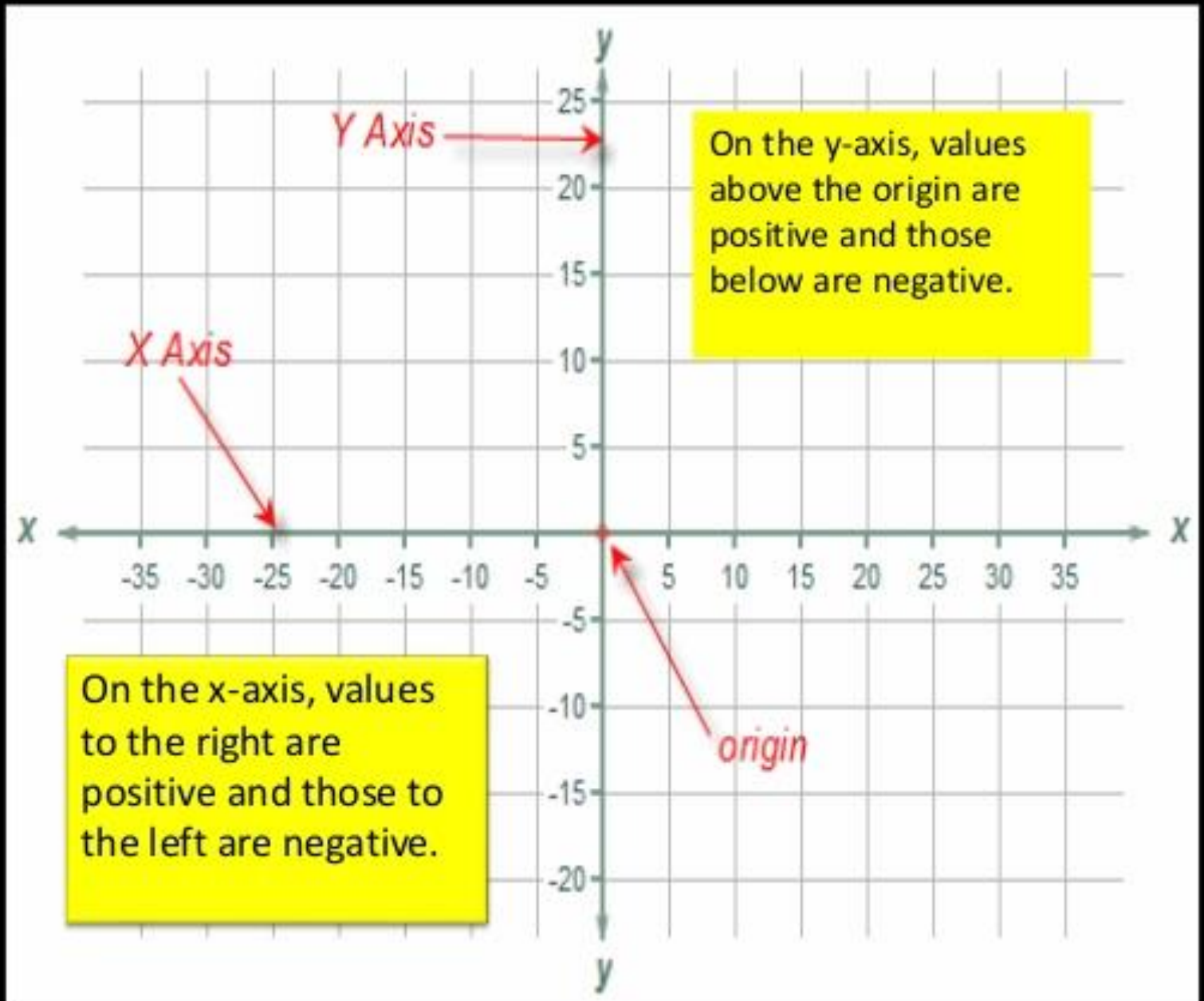
- There are also point which lie in x- and y-axes. The points which lie in the x-axis have coordinates (x,0) and the points which lie in the y-axis have coordinates (0,y), where x and y real numbers.

Quadrant

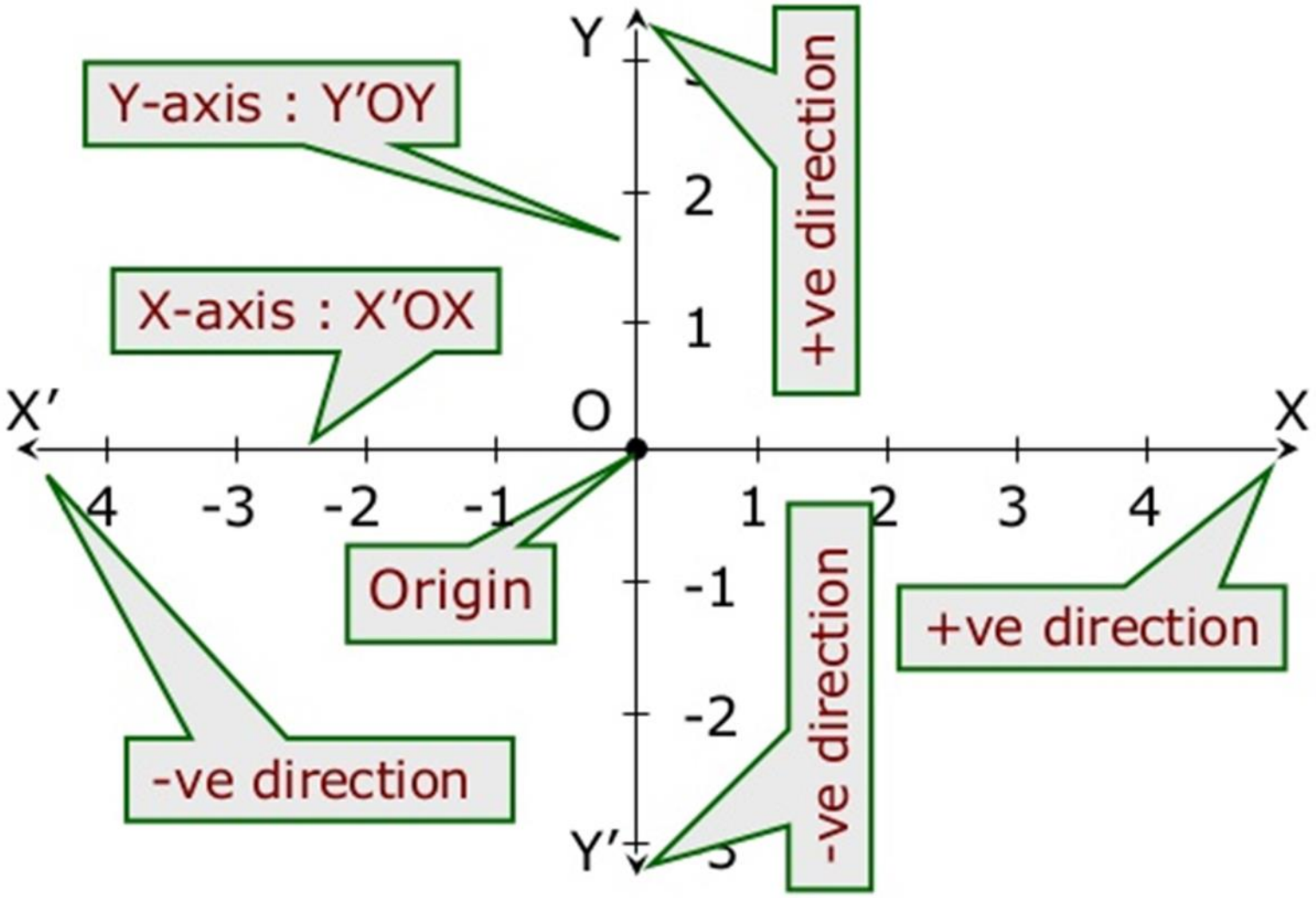

(-,+)
Y- axis
(+,+)
+3
nd Quadrant
+2
St Quadrant
II
I
+1
X- axis
X- axis
-3
-2
-1
+1
+2
+3
rd Quadrant
-1
th Quadrant
III
IV
-2
-3
(-,-)
Y- axis
(+,-)

CARTESIAN PLANE




y
Y Axis
25
20
15
10
5
On the y-axis, values above the origin are positive and those below are negative.
X Axis
x
x
-35 -30 -25 -20 -15 -10 -5 5 10 15 20 25 30 35
-5
-10
-15
-20
On the x-axis, values to the right are positive and those to the left are negative.
origin
y

RECAP
Coordinate Plane

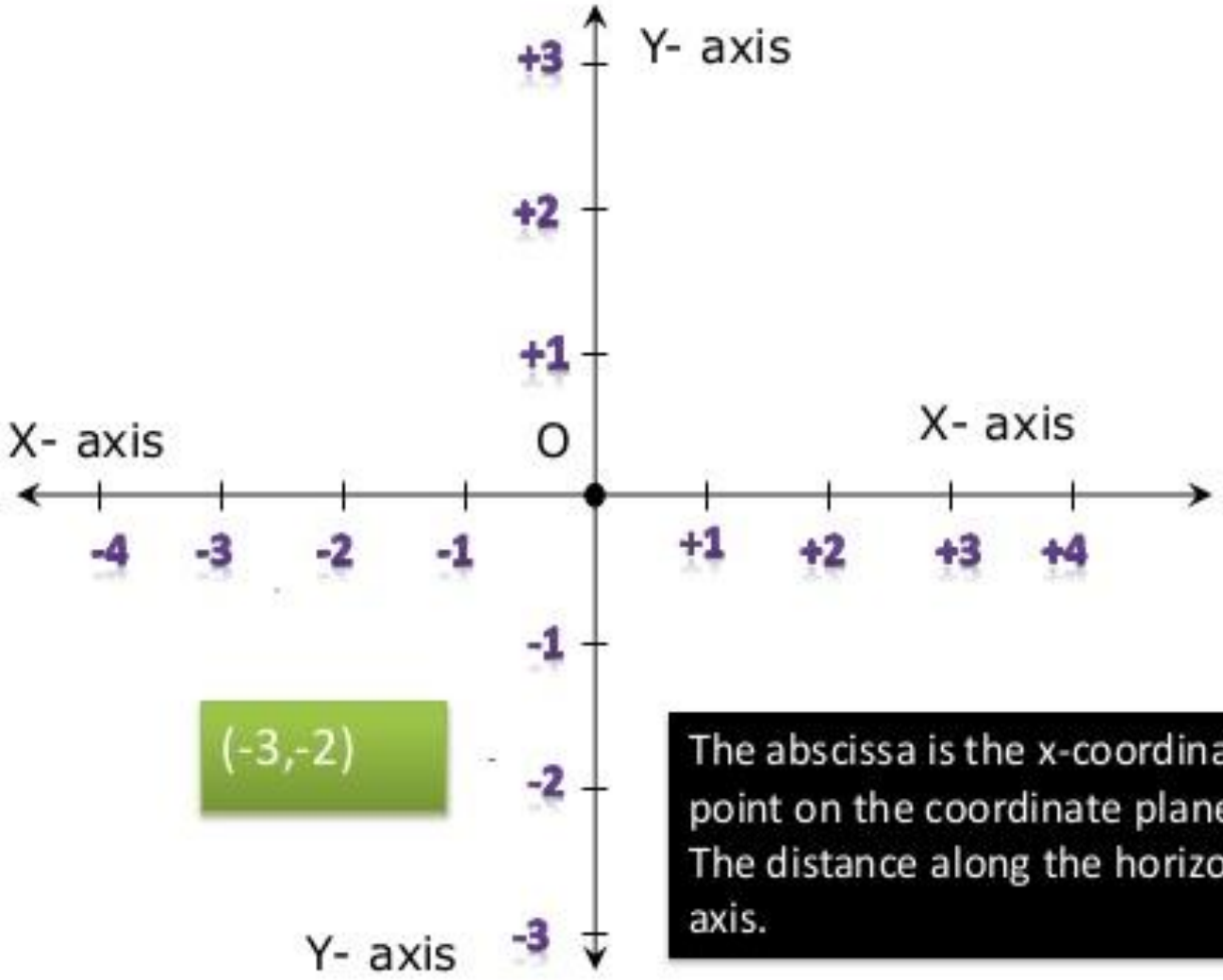


SOME BASIC POINTS

- To locate the position of a point on a plane,we require a pair of coordinate axes.
- The distance of a point from the y-axis is called its x-coordinate,OR abscissa.
- The distance of a point from the x-axis is called its y-coordinate,OR ordinate.

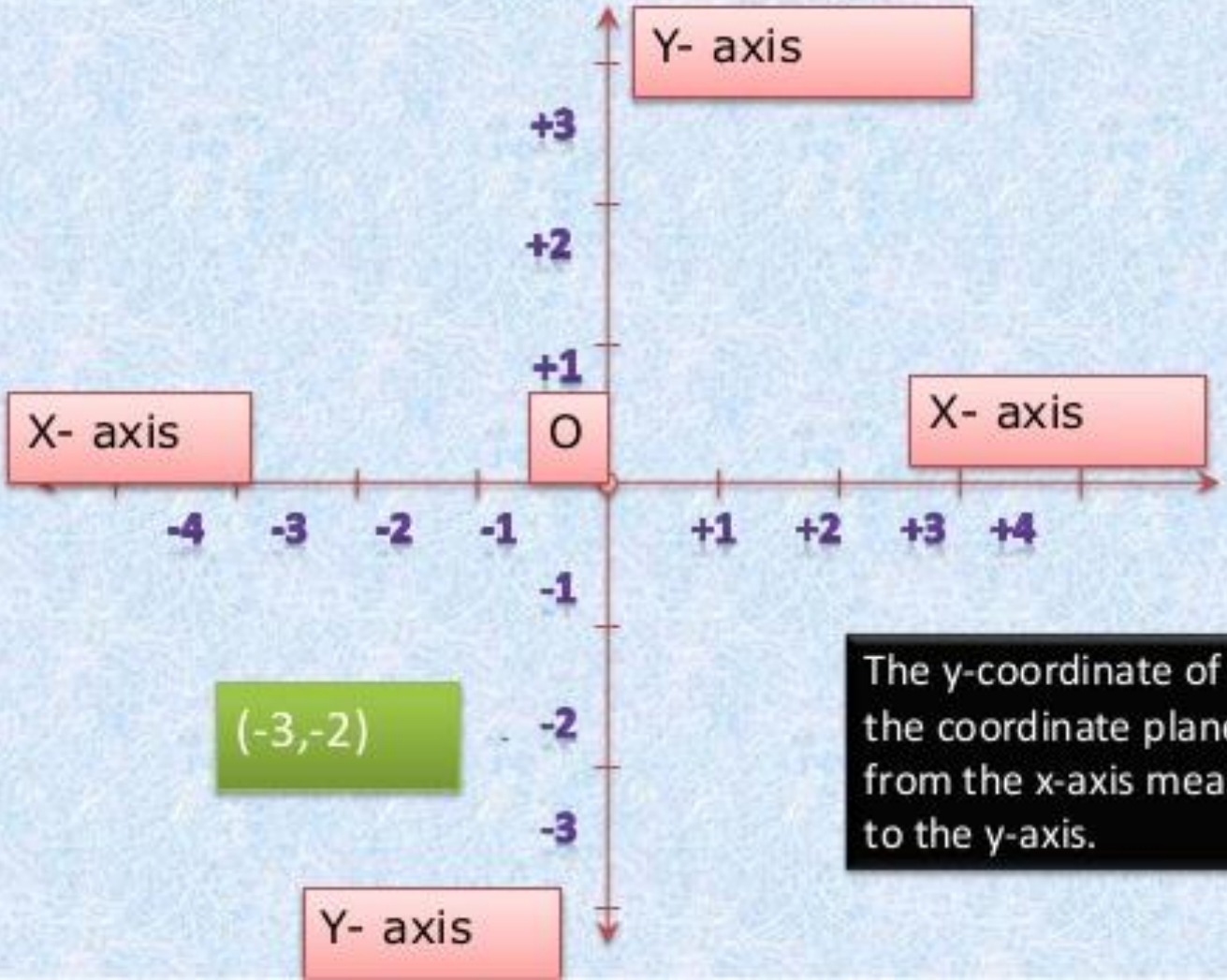
▪The coordinates of a point on the x-axis are of the form **(x, 0)** and of a point on the y-axis are of the form (0, y).

Abscissa



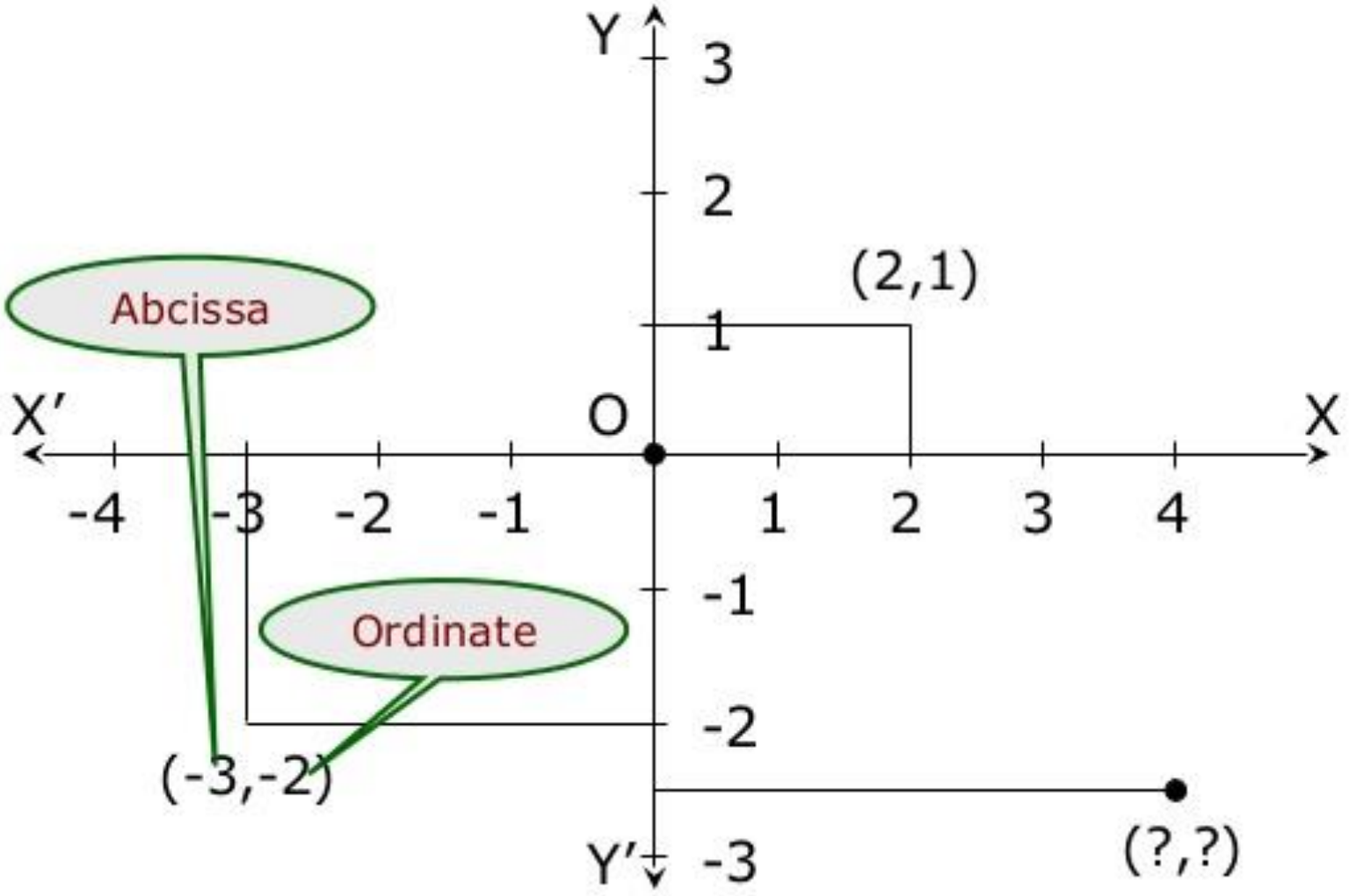
The abscissa is the x-coordinate of a point on the coordinate plane. The distance along the horizontal axis.

Ordinate



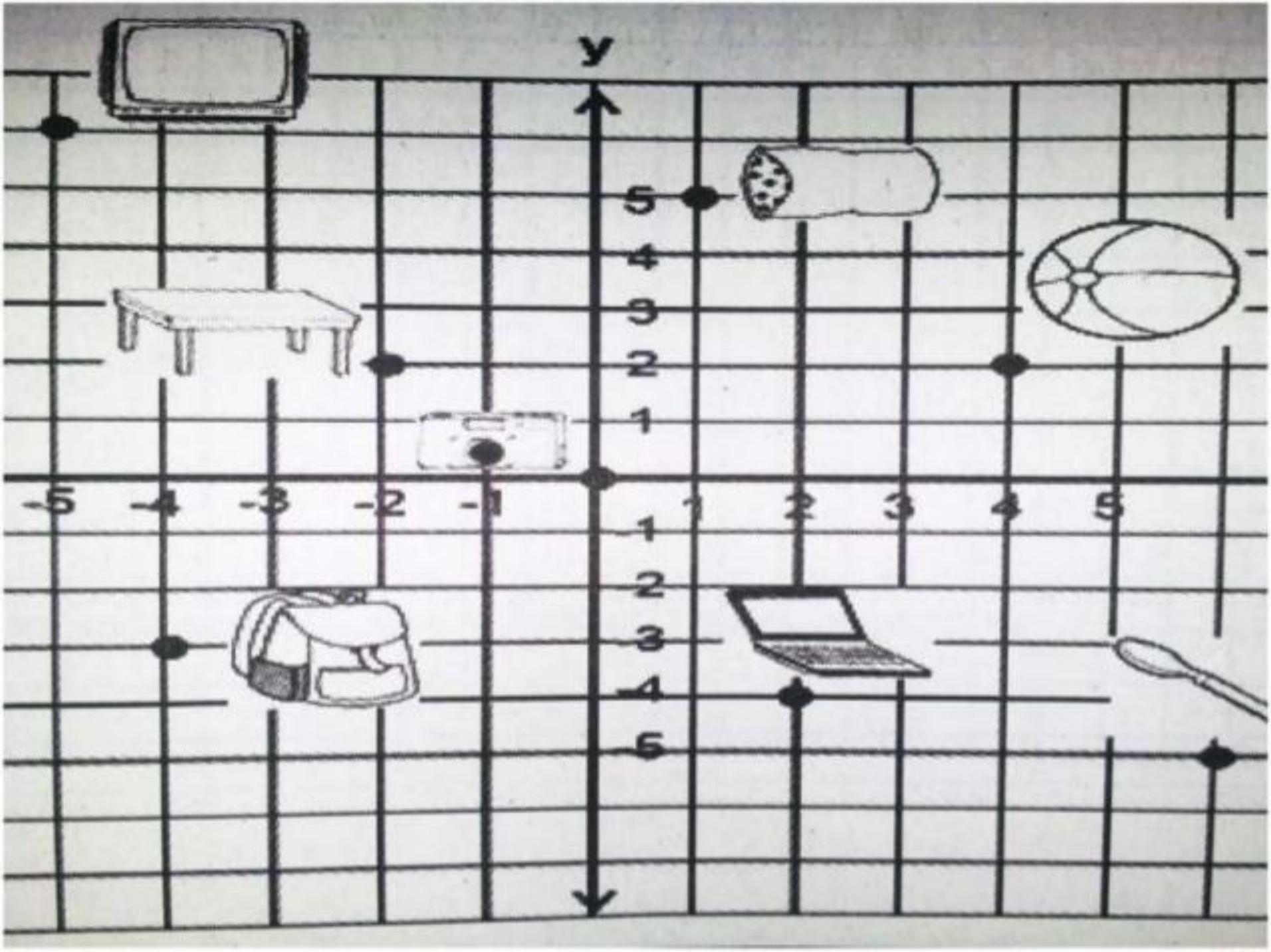
The y-coordinate of a point on the coordinate plane : its distance from the x-axis measured parallel to the y-axis.

Coordinates



Identify the Coordinates & the Quadrant/Axis where the following Objects were belonged

Object	Coordinates	Quadrant/Axis
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		


y
5
4
3
2
1
-5
-4
-3
-2
-1
1
2
3
4
5
1
2
3
4
6