**Elements of a graph**

We often use graphs to give us a picture of the relationships between variables.

**Basic construction of graphs**

Modern Cartesian coordinate system in two dimensions (also called a rectangular coordinate system) consists of two axes called the x (horizontal) and y (vertical) axes. These axes correspond to the variables we are relating.

The point where the two axes intersect is called the origin. The origin is also identified as the point (0, 0).

The arrows on the axes indicate that they extend forever in the same direction.

The intersection of the two axes creates four quadrants indicated by the roman numerals I, II, III, and IV. Conventionally, the quadrants are labeled counterclockwise starting from the northeast quadrant. In Quadrant I the values are (x,y), and II:(-x,y), III:(-x,-y) and IV:(x,-y).

To specify a particular point on a two dimensional coordinate system, you indicate the x unit first (abscissa), followed by the y unit (ordinate) in the form (x,y). (x,y) is called an ordered pair.

In a three dimensional coordinate system, another axis, normally labeled z, is added, providing a sense of a third dimension of space measurement. The axes are commonly defined as mutually orthogonal to each other (each at a right angle to the other). Coordinates in three dimensions are given as (x,y,z).

**Coordinates of Points**

A coordinate is one of a set of numbers used to identify the location of a point on a graph. Each point is identified by both an x-coordinate and a y-coordinate.

**Plotting Points on a Graph**

There are times when you are given a point and will need to find its location on a graph. This process is often referred to as plotting a point and uses the same skills as identifying the coordinates of a point on a graph. The process for plotting a point is shown using an example.

*Example Plot the point (200, 300).*

Step One Step Two Step Three First, draw a line extending out from the xaxis at the x-coordinate of the point. In our example, this is at 200. Then, draw a line extending out from the yaxis at the y-coordinate of the point. In our example, this is at 300. The point where these two lines intersect is at the point we are plotting (200, 300).