Functions and Graphs

In many areas of life, you are tasked with analyzing graphs, equations, and functions. Many people will invest in mutual funds as part of planning for their future retirement. To help a person decide which mutual funds to invest in, a person might obtain a function that models the growth of the mutual fund over a fifty-year period as well as look at the graph of the growth of a mutual fund. Being able to understand what a function represents and apply it to one’s own situation is an important skill.

Objectives;

* Plot points in the rectangular coordinate system.
* Graph equations in the rectangular coordinate system.
* Interpret information about a graphing utility’s viewing rectangle or table.
* Use a graph to determine intercepts.
* Interpret information given by graphs.

The rectangular coordinate system:

Each **point** in the rectangular coordinate system corresponds to an **ordered pair** of real numbers, (*x*, *y*).

The first number in each pair, called the ***x*-coordinate**, denotes the distance and direction from the origin along the *x*-axis. The second number in each pair, called the

***y*-coordinate**, denotes the vertical distance and direction from the origin along the *y*-axis.

A relationship between two quantities can be expressed as an **equation in two variables**, such as

A **solution of an equation in two variables**, *x* and *y*, is an ordered pair of real numbers with the following property: When the *x*-coordinate is substituted for *x* and the *y*-coordinate is substituted for *y* in the equation, we obtain a true statement.

Graphing calculators and graphing software packages for computers are referred to as **graphing utilities** or graphers. To graph an equation in *x* and *y* using a graphing utility, enter the equation and specify the size of the **viewing rectangle**. The size of the viewing rectangle sets minimum and maximum values for both the *x*-axis and the *y*-axis. The [–10,10,1] by [–10,10,1] viewing rectangle is called the **standard viewing rectangle**.

An ***x*-intercept** of a graph is the *x*-coordinate of a point where the graph intersects the *x*-axis. **The *y*-coordinate corresponding to an *x*-intercept is always zero**.

A ***y*-intercept** of a graph is the *y*-coordinate of a point where the graph intersects the *y*-axis. **The *x*-coordinate corresponding to a *y*-intercept is always zero**.