

Name: Key

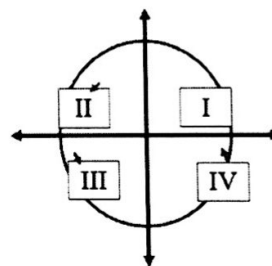
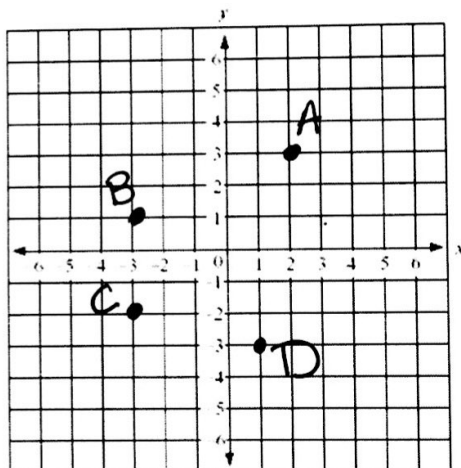
Section 1-9: Patterns, equations, and Graphs

Objectives: 1) To use tables, equations, and graphs to describe relationships.

The system for graphing points and lines in a plane that we use today was invented by a man named Descartes, so it has become known as the Cartesian Plane.

In this system, every point can be represented by an ordered pair (x, y) , where x is horizontal, and y is vertical, measured from the middle of the system which is the point $(0, 0)$, also called the origin.

Mark and label the following points: the *origin*, $A(2, 3)$, $B(-3, 1)$, $C(-3, -2)$ and $D(1, -3)$.



The x -axis and the y -axis divide the graphing plane into four regions called quadrants I, II, III, and IV. They are numbered COUNTER CLOCKWISE starting from the upper right quadrant, as shown below. Points that lie on either axis do not lie in any quadrant.

A solution of an equation with two variables x and y is any ordered pair (x, y) that makes the equation true.

Problem 1 – Identifying Solutions of two variable equations

Are $(3, 10)$ and $(2, 8)$ solutions to the equation $y = 4x$?

$$10 = 4(3)$$

$$10 \neq 12$$

$(3, 10)$ NOT a solution

$$8 = 4(2)$$

$$8 = 8 \checkmark$$

$(2, 8)$ is a solution

If you get a TRUE statement, the ordered pair IS a solution to the equation.
 If you get a FALSE statement, the ordered pair IS NOT a solution to the equation.

Now you try...

Is the ordered pair (3,7) a solution to the equation $y=2x+1$? Show your work.

$$7 = 2(3) + 1$$

$$7 = 7 \checkmark$$

Yes, IS a solution.

Problem 2 – Using a Table, an Equation, and a Graph

Example: Avant runs 6 laps before Aaron meets him at the track. They then run together at the same pace. How can you represent the relationship between the number of laps Avant runs and the number of laps Aaron runs in different ways?

Table:

Number of Laps Aaron Runs	0	1	2	3	4	5	6	7
Number of Laps Avant Runs	6	7	8	9	10	11	12	13

Equation:

Let x = the number of laps Aaron runs

Then y = the number of laps Avant runs

Equation: $y = x + 6$

Graph:

