Section 3.3: SLOPE

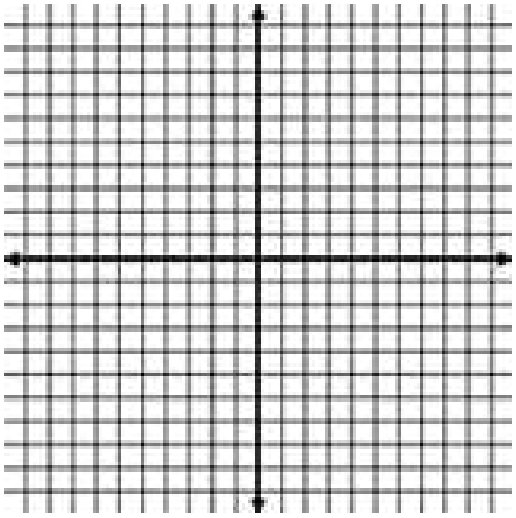
When you are done with your homework you should be able to…

- Compute a line's slope
- Use slope to show that lines are parallel
- Use slope to show that lines are perpendicular
- Calculate rate of change in applied situations

WARM-UP:

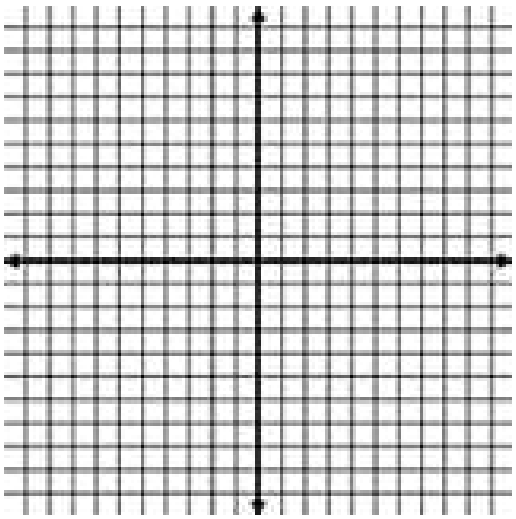
Graph each equation.

a. $y-2=0$



b. $-2x-3y=9$

x	$-2x-3y=9$	(x,y)



THE SLOPE OF A LINE

Mathematicians have developed a useful _____ of the _____ of a line, called the _____ of the line. Slope compares the _____ change (the _____) to the _____ change (the _____) when moving from one _____ point to another along the line.

DEFINITION OF SLOPE

The _____ of the line through the distinct points _____ and _____ is

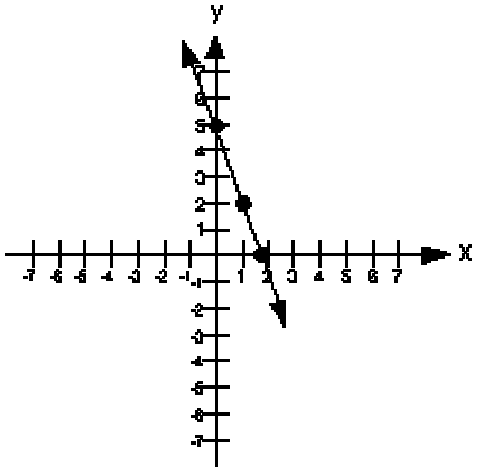
where _____. It is common to use the letter _____ to represent the slope of a line. This letter is used because it is the first letter of the French verb monter, meaning to rise, or to ascend.

Example 1: Find the slope of the line passing through each pair of points:

a. $(-1,4)$ and $(3,-6)$

b. $\left(8,\frac{3}{2}\right)$ and $\left(-\frac{5}{2},7\right)$

Example 2: Use the graph to find the slope of the line



POSSIBILITIES FOR A LINE'S SLOPE

POSITIVE SLOPE	NEGATIVE SLOPE	ZERO SLOPE	UNDEFINED SLOPE

SLOPE AND PARALLEL LINES

Two _____ lines that lie in the same plane are _____. If two lines do not _____, the _____ of the _____ change to the _____ change is the _____ for each _____. Because two parallel lines have the same _____, they must have the same _____.

1. If two nonvertical lines are _____, then they have the same _____.
2. If two distinct nonvertical lines have the same _____, then they are _____.
3. Two distinct vertical lines, each with _____ slope, are _____.

SLOPE AND PERPENDICULAR LINES

Two lines that _____ at a _____ _____ (_____) are said to be _____.

1. If two nonvertical lines are _____, then the _____ of their _____ is _____.
2. If the _____ of the _____ of two lines is _____, then the lines are _____.

3. A _____ line having _____ slope is _____ to a vertical line having _____ slope.

Example 3: Determine whether the lines through each pair of points are parallel, perpendicular, or neither.

a. $(-2,-15)$ and $(0,-3)$; $(-12,6)$ and $(6,3)$

b. $(-2,-7)$ and $(3,13)$; $(-1,-9)$ and $(5,15)$

c. $(-1,-11)$ and $(0,-5)$; $(0,-8)$ and $(12,-6)$

APPLICATION

Construction laws are very specific when it comes to access ramps for the disabled. Every vertical rise of 1 foot requires a horizontal run of 12 feet. What is the grade of such a ramp? Round to the nearest tenth of a percent.