Lesson 6.3: Slope of a Line   Date: _____

Learning Goal: We are learning how slope impacts a linear equation. It's all downhill from here!

In this lesson, we will explore the most significant property of a linear relationship: the slope! The slope of a line tells us how the relationship is changing and can be thought of as how slanted/steep the line is. It has many important applications such as engineering the initial climb of a roller coaster to making safe ramps, but today we will focus on the algebra and understanding how to calculate the slope of a line.
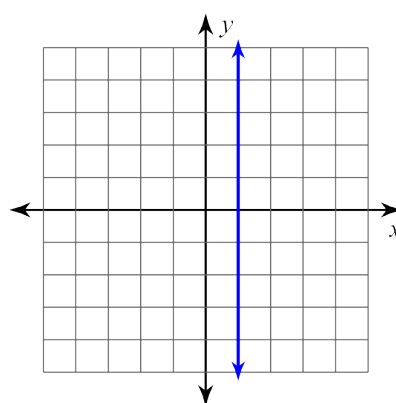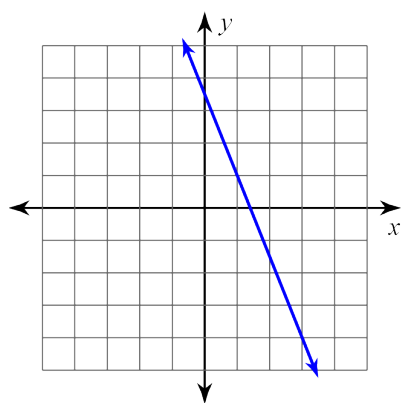
First, let's look at the slope from a geometric perspective. The slope, defined by the letter m for no apparent reason, is: $m = \dfrac{Rise}{Run}$

Example 1: Given the line with two points, calculate the slope.
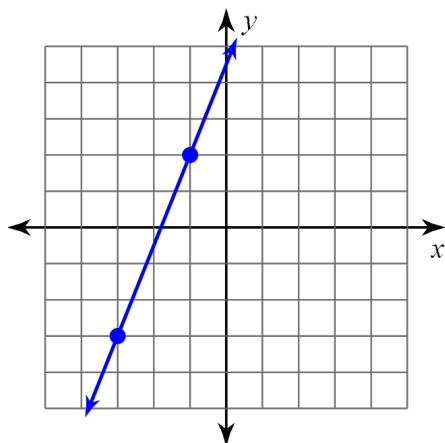
Example 2: Given the line, locate two points, then calculate the slope.
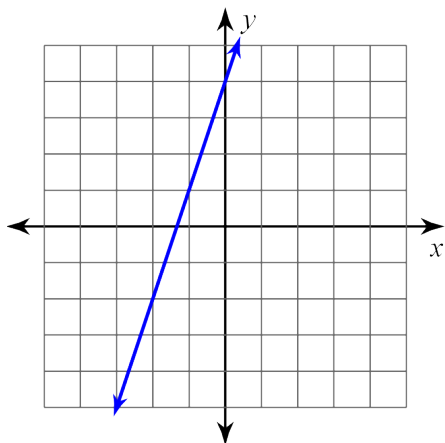
Are slopes always positive? There are 4 possible slopes:

Example 3 and 4: Calculate the slopes of each line.

Now that we know about slope, we can derive a formula so that we do not need a graph.

Examples 5-8: Given the points, calculate the slope using the slope formula.

5. $(7, -10), (9, -7)$

6. $(-6, -17), (-20, 11)$

7. $(6, -12), (6, 1)$

8. $(-3, 9), (3, 9)$

Examples 9 and 10, use the idea of "change" to calculate the slope:

9. $(5, 8), (10, 2)$

10. $(-7, 9), (-15, -11)$

Example 9: A ramp needs to be constructed to go from the ground to a doorway. The doorway is 90 cm from the ground and the ramp needs a slope of $\frac{2}{9}$.

a) Calculate how far the ramp will start from the edge of the house.

b) Calculate the length of the ramp.

Success Criteria
- I can identify the four types of slope: positive, negative, zero, undefined
- I can find the slope of a line graphically by studying its $\frac{rise}{run}$
- I can calculate the slope of a line algebraically by using the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$
- I can find a missing coordinate, if given the slope