Unit 4 – Lesson 16   Name: _____

The Computation of Slope of a Non-Vertical Line   Date: _____   Period: _____

Focus Standards:	8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
	8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation for a line through the origin and the equation for a line intercepting the vertical axis at .

Student Outcomes
- Students use the slope formula to compute the slope of a non-vertical line.
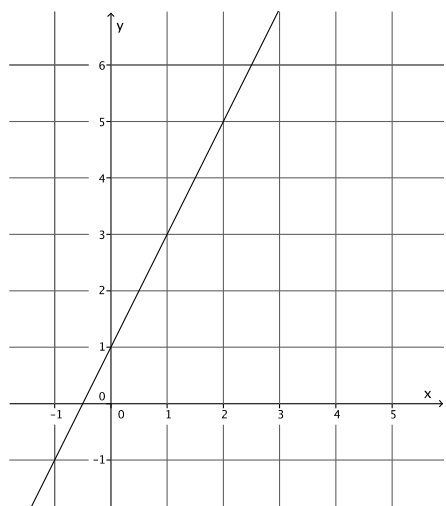
Example 1

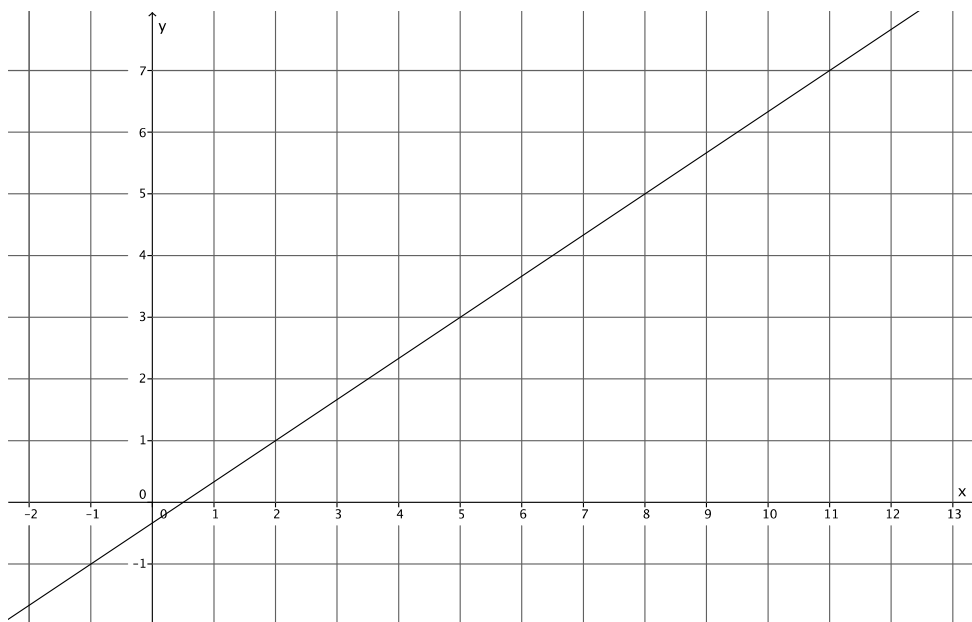Using what you learned in the last lesson, determine the slope of the line with the following graph.
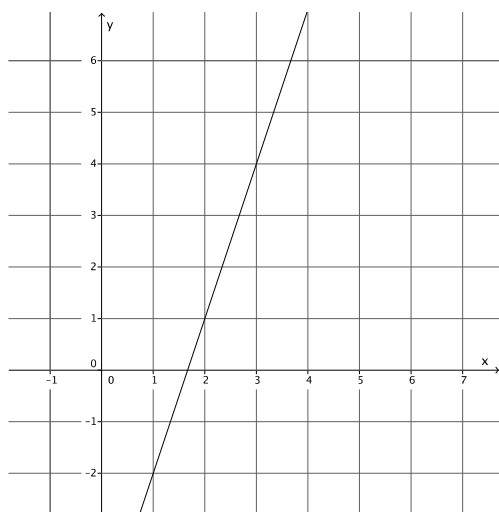
Example 2

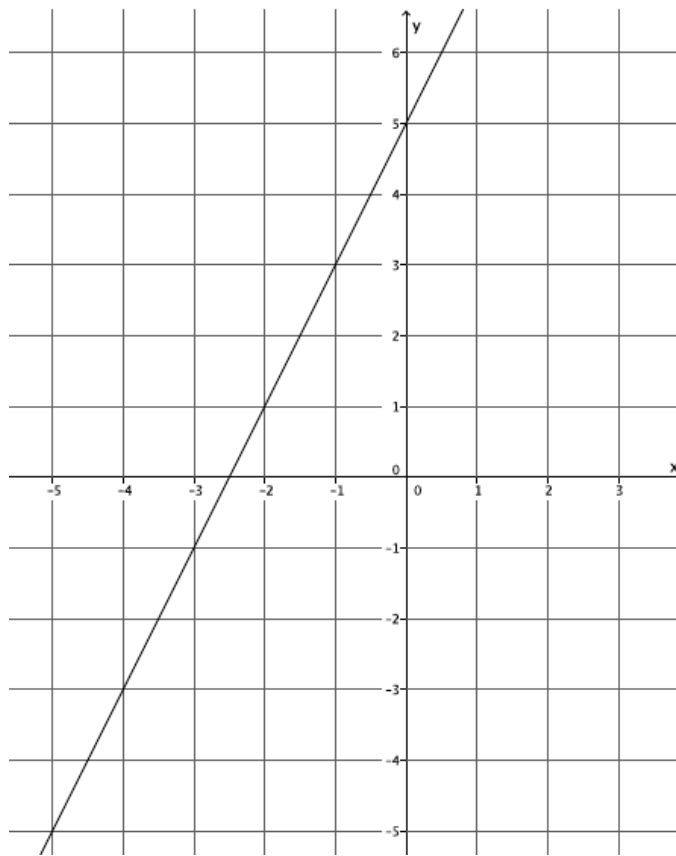Using what you learned in the last lesson, determine the slope of the line with the following graph.

Example 3

What is different about this line compared to the last two examples?

Exercise

Let's investigate concretely to see if the claim that we can find slope between any two points is true.
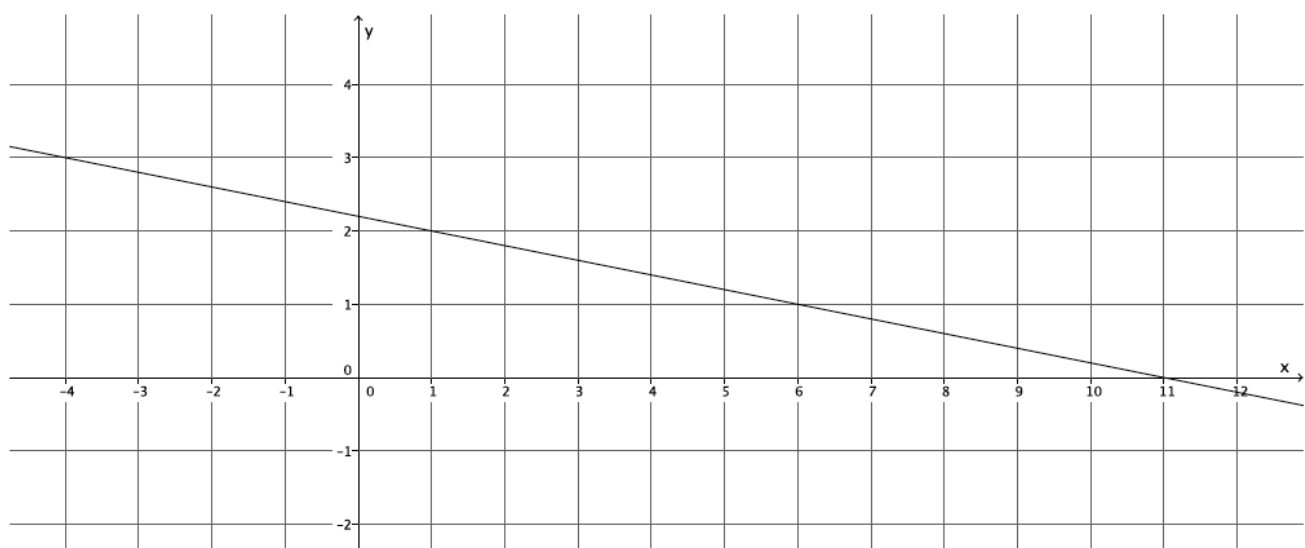

a. Select any two points on the line to label as P and $R.$

b. Identify the coordinates of points P and $R.$

c. Find the slope of the line using as many different points as you can. Identify your points and show your work below.
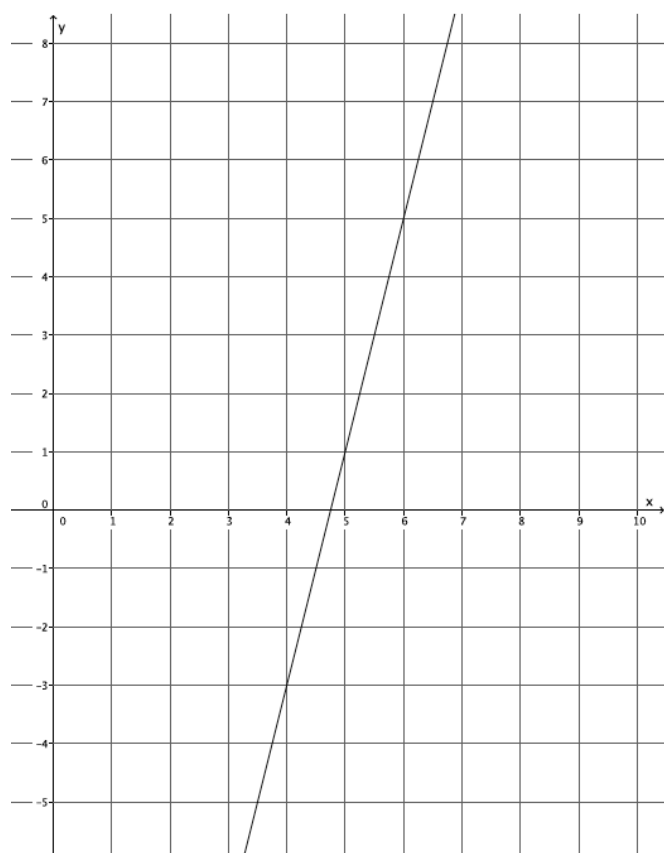
Problem Set

1. Calculate the slope of the line using two different pairs of points.
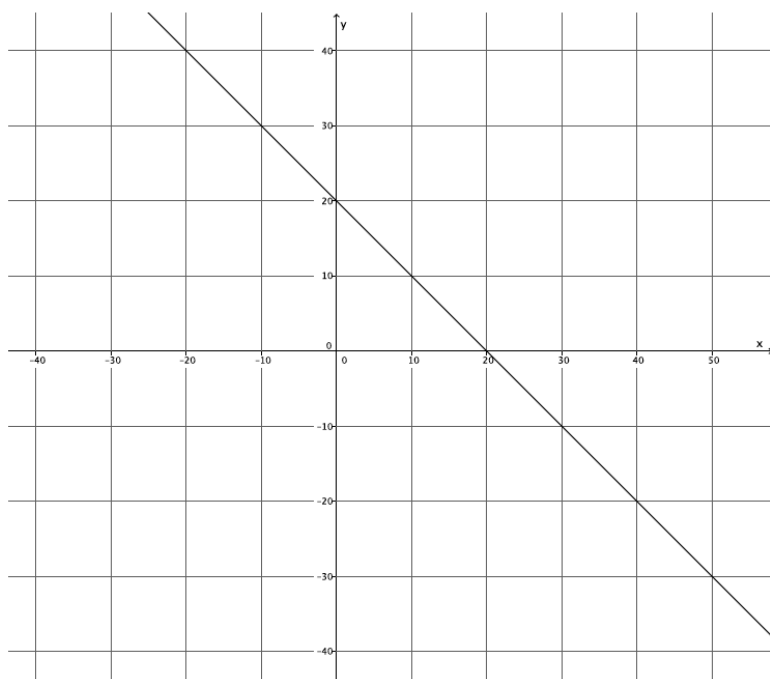
2. Calculate the slope of the line using two different pairs of points.

3. Calculate the slope of the line using two different pairs of points.

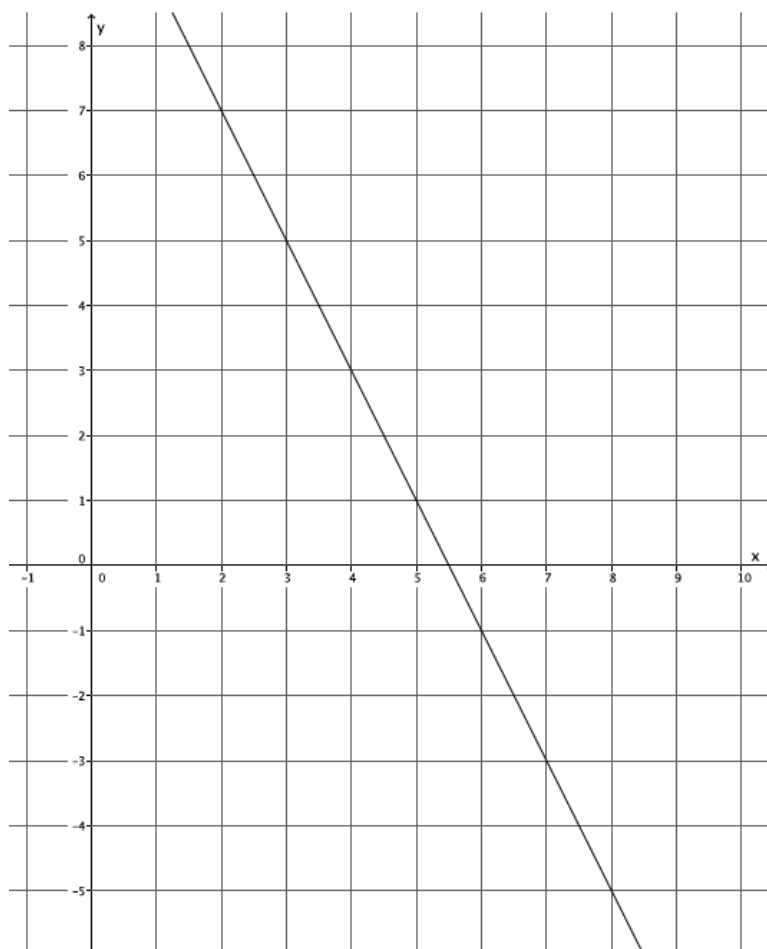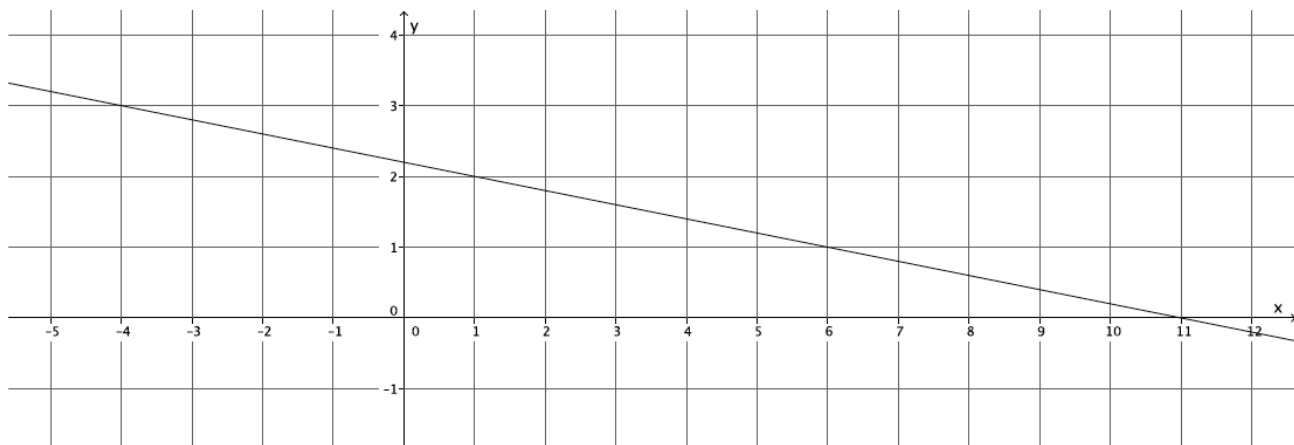4. Calculate the slope of the line using two different pairs of points.
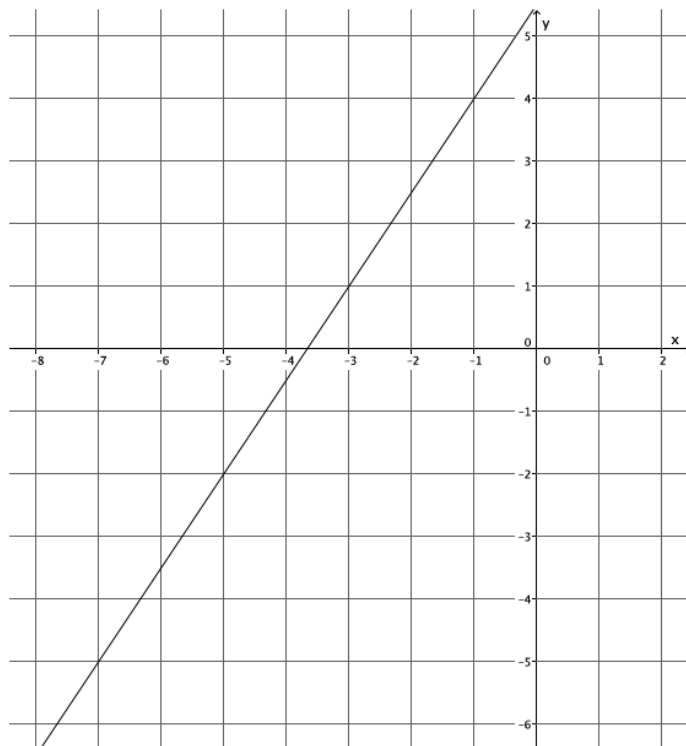

5. Calculate the slope of the line using two different pairs of points.

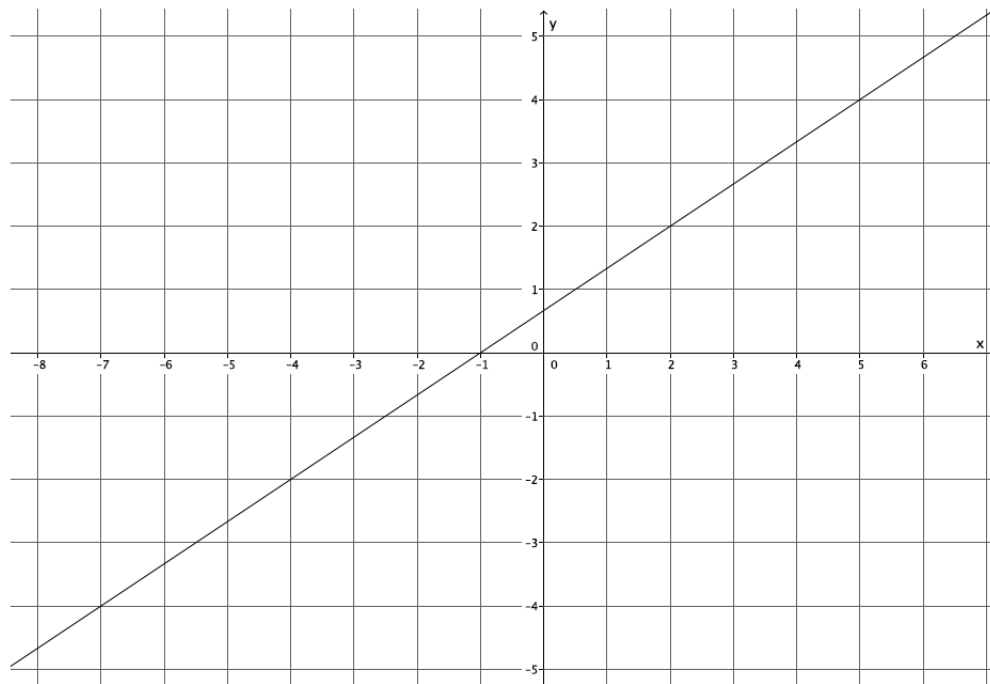6. Calculate the slope of the line using two different pairs of points.

   a. Select any two points on the line to compute the slope.

   b. Select two different points on the line to calculate the slope.

   c. What do you notice about your answers in parts (a) and (b)? Explain.

7. Calculate the slope of the line in the graph below.

8. Your teacher tells you that a line goes through the points $\left(-6, \frac{1}{2}\right)$ and $(-4, 3)$.

   a. Calculate the slope of this line.

   b. Do you think the slope will be the same if the order of the points is reversed? Verify by calculating the slope and explain your result.

9. Use the graph to complete parts (a)–(c).

   a. Select any two points on the line to calculate the slope.
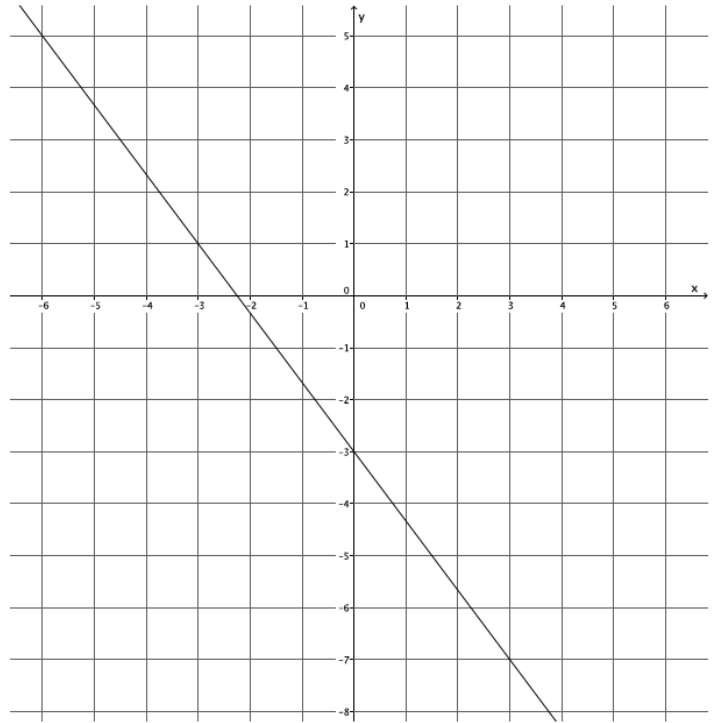
   b. Compute the slope again, this time reversing the order of the coordinates.

   c. What do you notice about the slopes you computed in parts (a) and (b)?

   d. Why do you think slope (m) = $\dfrac{y_2 - y_1}{x_2 - x_1}$ = $\dfrac{y_1 - y_2}{x_1 - x_2}$

10. Each of the lines in the lesson was non-vertical. Consider the slope of a vertical line, $x = 2$. Select two points on the line to calculate slope. Based on your answer, why do you think the topic of slope focuses only on non-vertical lines?