

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

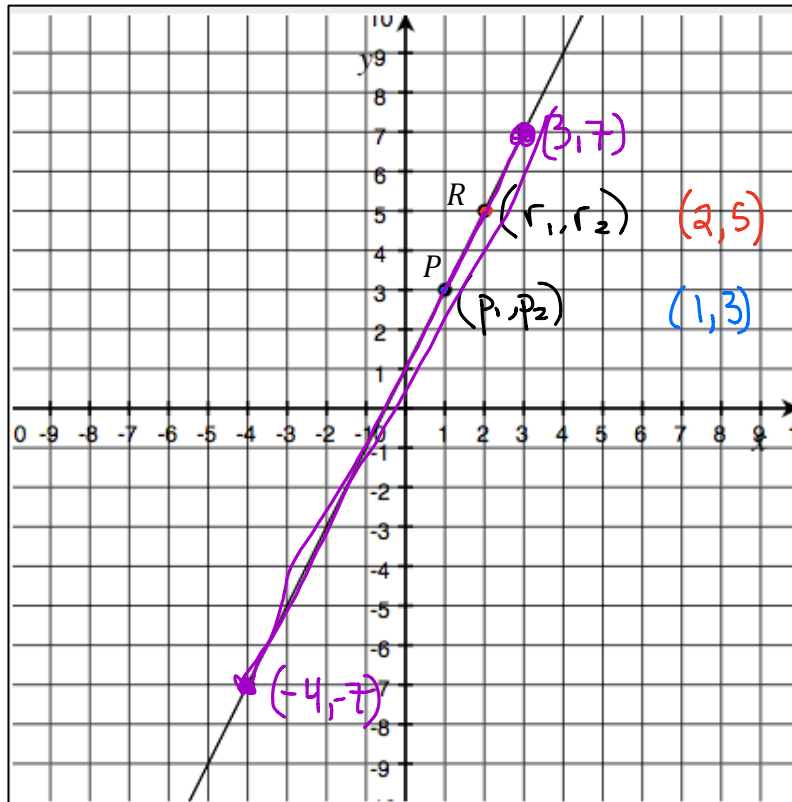
LEARNING OBJECTIVE: We will use the slope formula when computing the slope of a line and explore the concept of slope triangles. (G8M4L15)

CONCEPT DEVELOPMENT:

Slope: A measure of the steepness or slant of a line.

Slope is also the measure of the **rate of change** of a line.

UNIT
RATE



$$\frac{p_2 - r_2}{p_1 - r_1}$$

$$\frac{3 - 5}{1 - 2} = \frac{-2}{-1} = 2$$

$$m = \frac{7 - (-7)}{3 - (-4)} = \frac{14}{7} = 2$$

$$\frac{-7 - 7}{-4 - 3} = \frac{-14}{-7} = 2$$

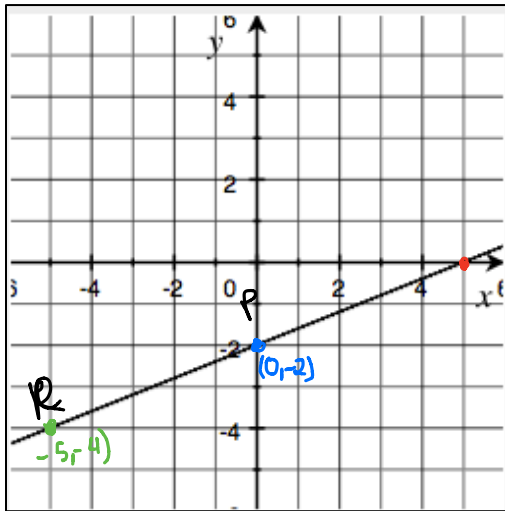
SLOPE FORMULA:

Where the coordinates of point P on a line are represented by $P = (p_1, p_2)$ and the coordinates of point R on the line are represented by $R = (r_1, r_2)$, the slope formula states that:

$$m = \frac{(p_2 - r_2)}{(p_1 - r_1)} = \frac{\text{rise}}{\text{run}} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{difference in } y \text{ - values}}{\text{difference in } x \text{ - values}}$$

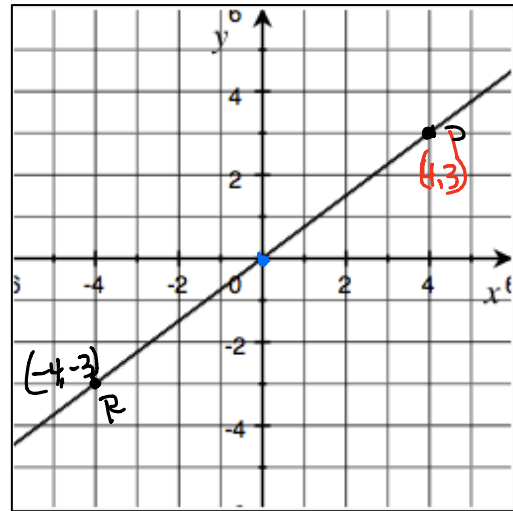
GUIDED PRACTICE:**Steps for Calculating the Slope (rate of change) of a Line**

1. Select any two integer points. Label them P and R .
2. Use the slope formula $(m = \frac{p_2 - r_2}{p_1 - r_1})$ to calculate the slope.

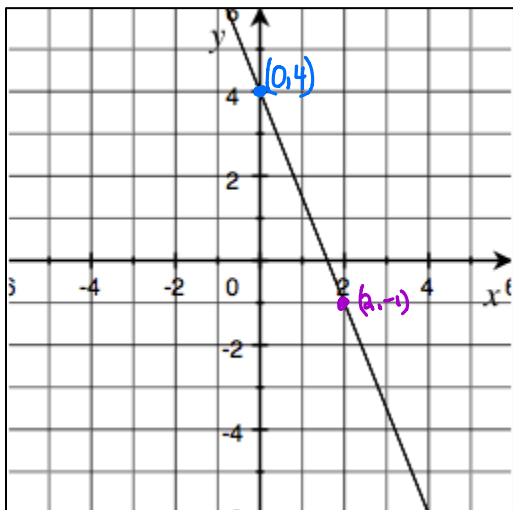


$$m = \frac{-2 - (-4)}{0 - (-5)} = \frac{2}{5}$$

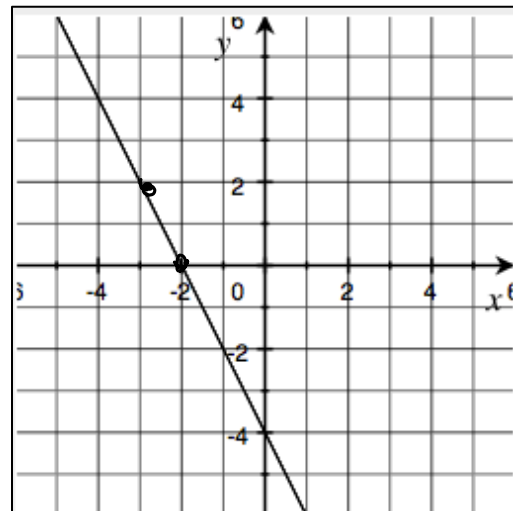
$$\frac{-4 - (-2)}{-5 - 0} = \frac{-2}{-5} = \frac{2}{5}$$



$$m = \frac{-3 - 3}{-4 - 4} = \frac{-6}{-8} = \frac{3}{4}$$



$$m = \frac{4 - (-1)}{0 - 2} = \frac{5}{-2} = -\frac{5}{2}$$



$$m = -2$$

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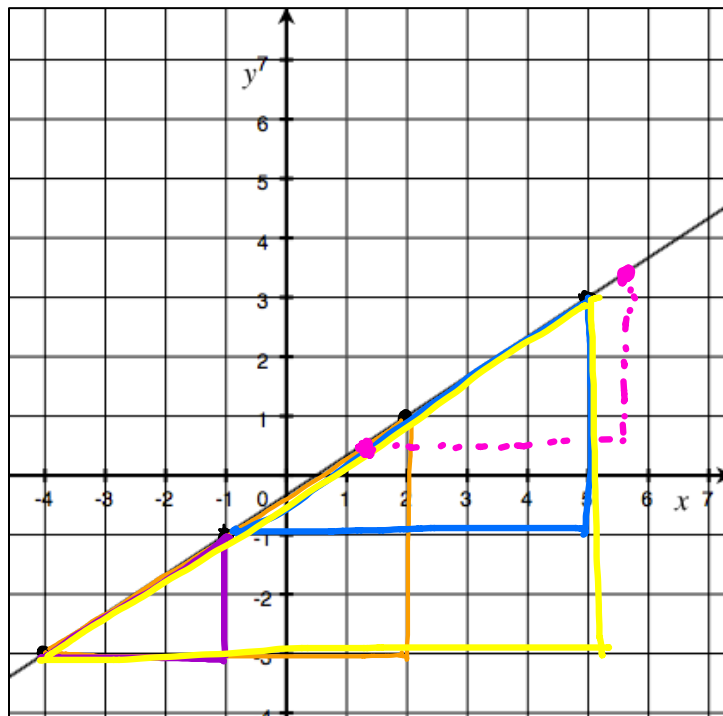
A Closer Look at Slope Triangles:

It doesn't matter what two points we look at. The ratio of rise to run will be the same!

What do we know about two similar triangles:

- The measures of the angles are the same
- The ratio of the corresponding sides is equal.

KNOW THIS!!



Identify the integer coordinates of the line above:

(2,1) (5,3) (-1,-1) (4,-3)

Create several right triangles (slope triangles) above.

Calculate the ratio of the corresponding sides....what do you notice?

$$\frac{6}{9} = \frac{4}{6} = \frac{4}{6} = \frac{2}{3}$$

The slope of a line is the same between any two points on the line!!

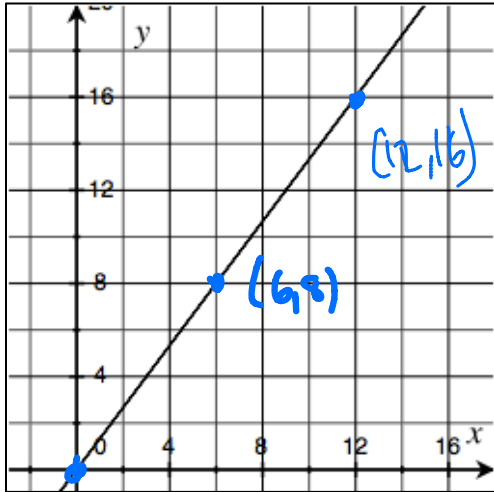
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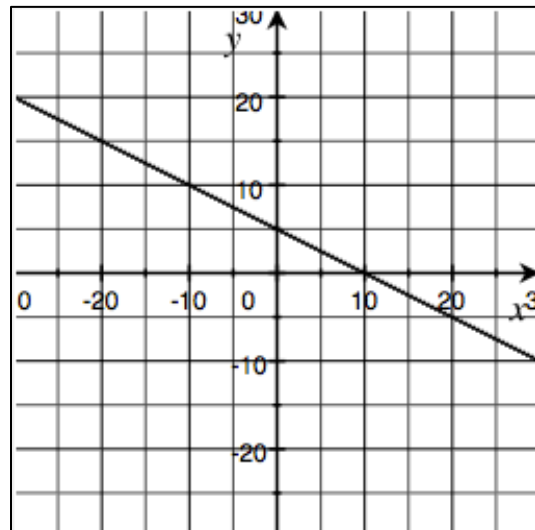
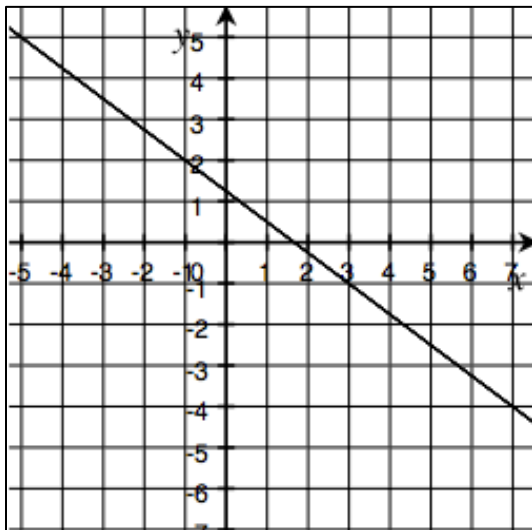
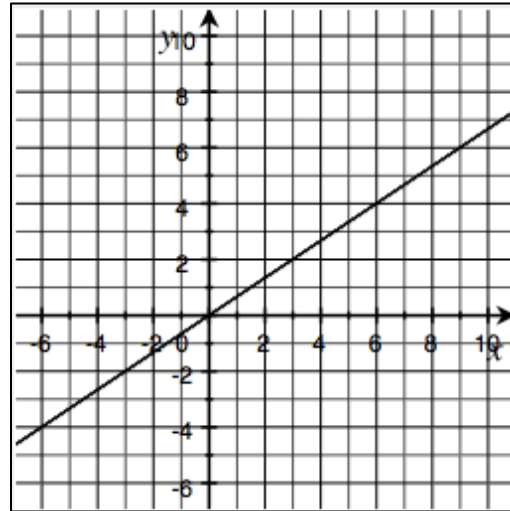
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**ON THIS PAGE, USE TWO DIFFERENT PAIRS
OF POINTS TO CALCULATE THE SLOPE.**



$$m = \frac{8-0}{6-0} = \frac{4}{3}$$

$$m = \frac{8-16}{6-12} = \frac{-8}{-6} = \frac{4}{3}$$



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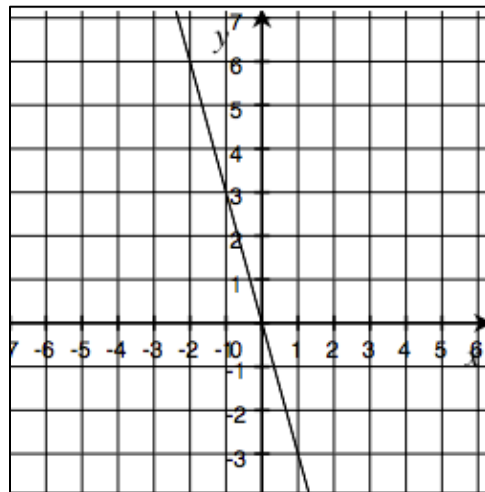
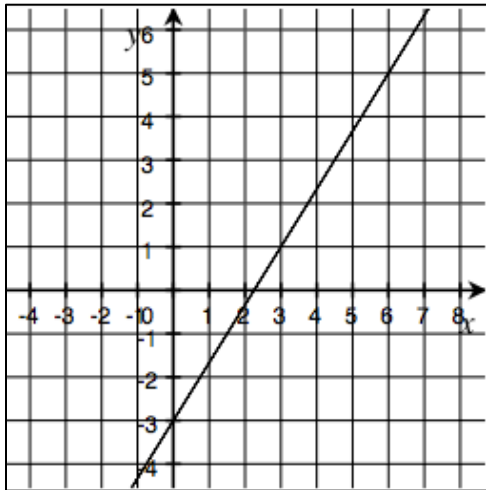
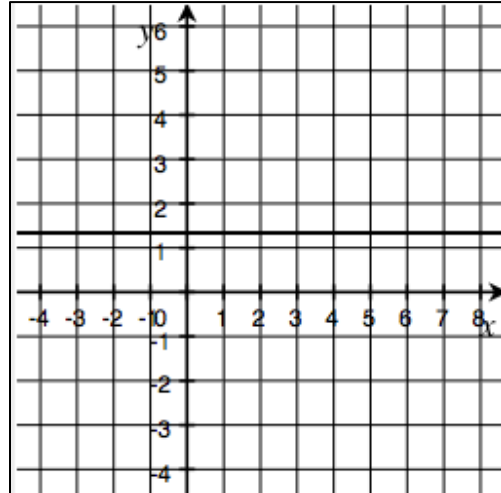
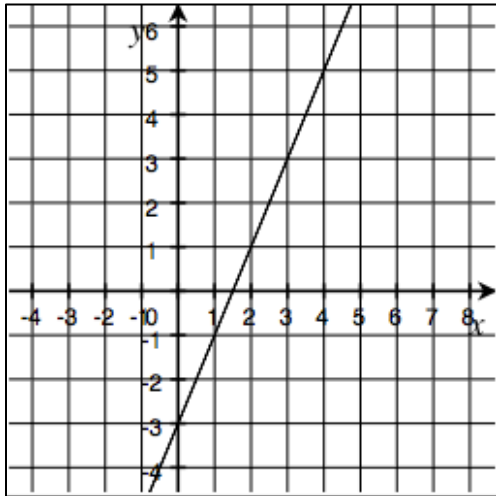
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INDEPENDENT PRACTICE:

Use two different pairs of points to calculate slope below



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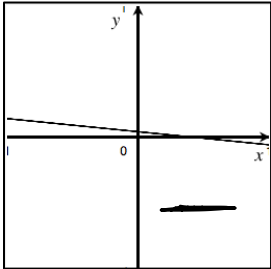
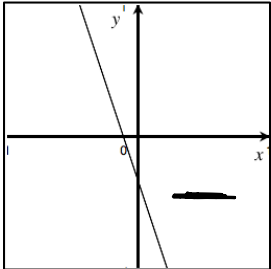
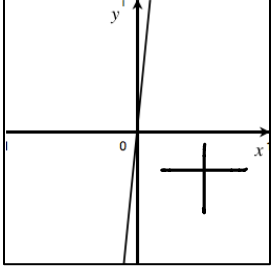
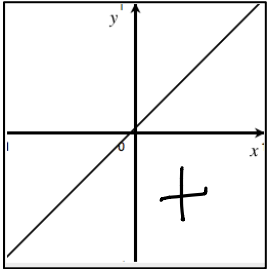
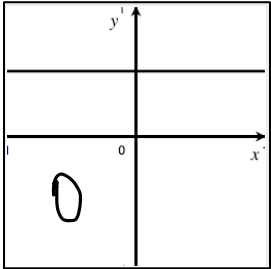
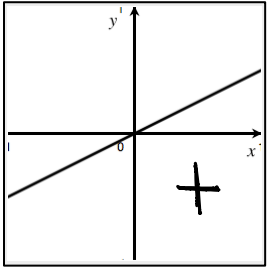
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ACTIVATING PRIOR KNOWLEDGE:

We can visually distinguish between lines with negative slope and lines with positive slope:

Label each graph as having positive, negative or zero slope

A. 	B. 	C. 
D. 	E. 	F. 

CLOSURE:

POINT P HAS COORDINATES OF $(3, -5)$ AND IS ON A LINE THAT HAS A SLOPE OF 4. IDENTIFY TWO OTHER COORDINATES THAT WOULD ALSO BE ON THE SAME LINE.

TEACHER NOTES:

This is lesson 16 from Module 4, grade 8.