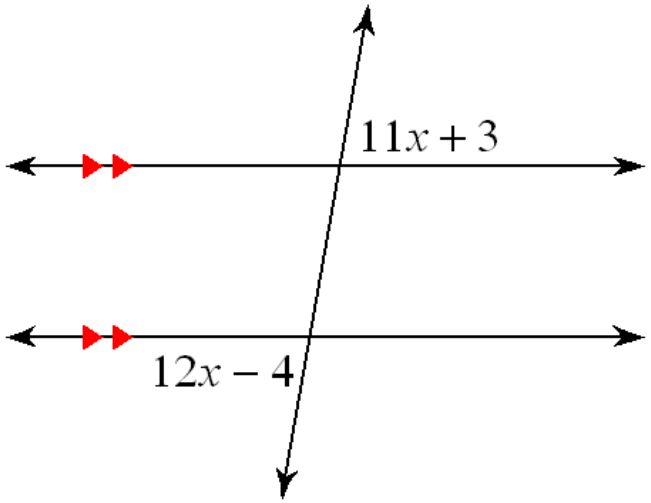
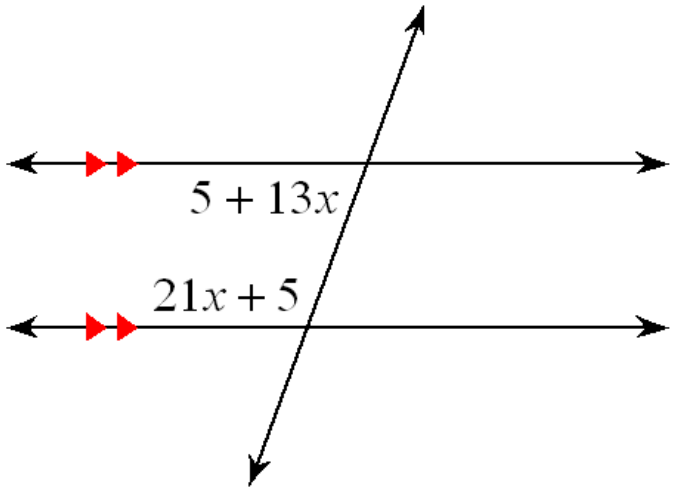
Find the value of x.

1.



2.



Warm Up

Find the value of *m*.

1. $m = \frac{7-5}{8-3}$

$\frac{2}{5}$

2. $m = \frac{(-3)-6}{5-(-1)}$

$-\frac{3}{2}$

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

undefined

4. $m = \frac{-3+3}{1-6}$

0

Objectives

Find the slope of a line.

Slope - describes the steepness of the line. Can use any two points on the line to find slope.

3-5 Slopes of Lines

$$\text{Slope} = \frac{rise}{run}$$

Graph

Slope Formula: Label two points

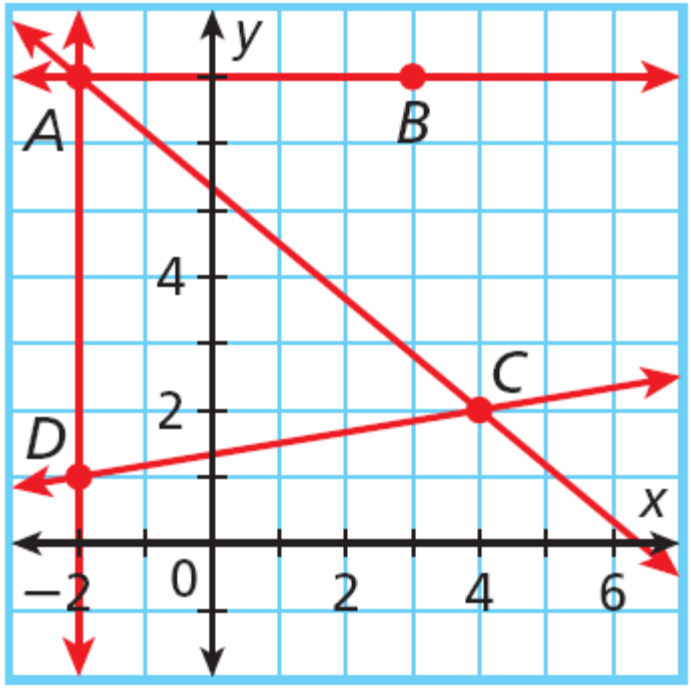
(x_1, y_1) and (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example 1A: Finding the Slope of a Line

Use the slope formula to determine the slope of each line.

$\overleftrightarrow{AB}$



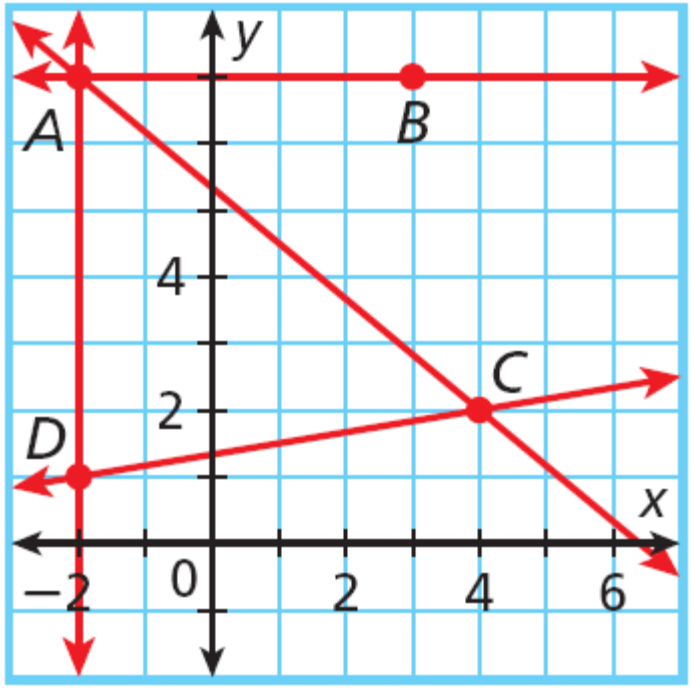
Substitute (−2, 7) for (x_1, y_1) and (3, 7) for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 7}{3 - (-2)} = \frac{0}{5} = 0$$

Example 1B: Finding the Slope of a Line

Use the slope formula to determine the slope of each line.

$\overleftrightarrow{AC}$



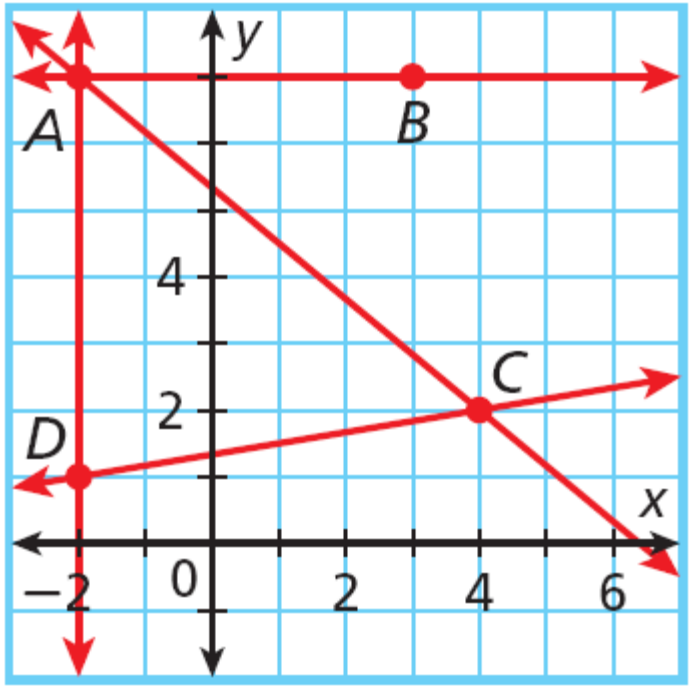
Substitute $(-2, 7)$ for (x_1, y_1) and $(4, 2)$ for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2-7}{4-(-2)} = \frac{-5}{6} = -\frac{5}{6}$$

Example 1C: Finding the Slope of a Line

Use the slope formula to determine the slope of each line.

$\overleftrightarrow{AD}$



Substitute $(-2, 7)$ for (x_1, y_1) and $(-2, 1)$ for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-7}{2-(-2)} = \frac{-6}{0}$$

The slope is undefined.

You cannot divide by zero:

If 0 is under the line, the slope is undefined.

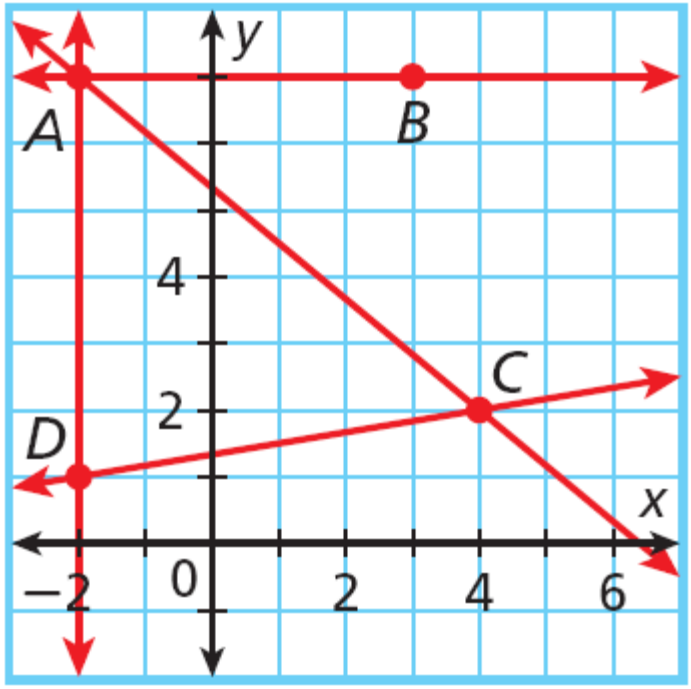
Example 1D: Finding the Slope of a Line

Use the slope formula to determine the slope of each line.

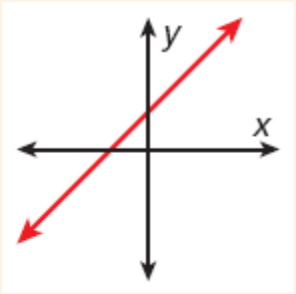
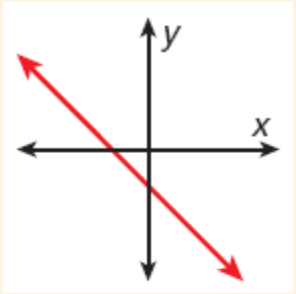
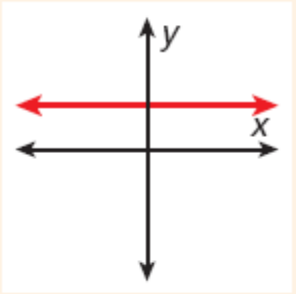
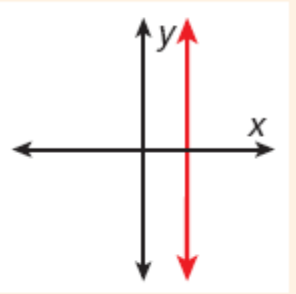
$\overleftrightarrow{CD}$

Substitute (4, 2) for (x_1, y_1) and (–2, 1) for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-2}{-2-4} = \frac{-1}{-6} = \frac{1}{6}$$



3-5 Slopes of Lines

Summary: Slope of a Line			
Positive Slope	Negative Slope	Zero Slope	Undefined Slope
			

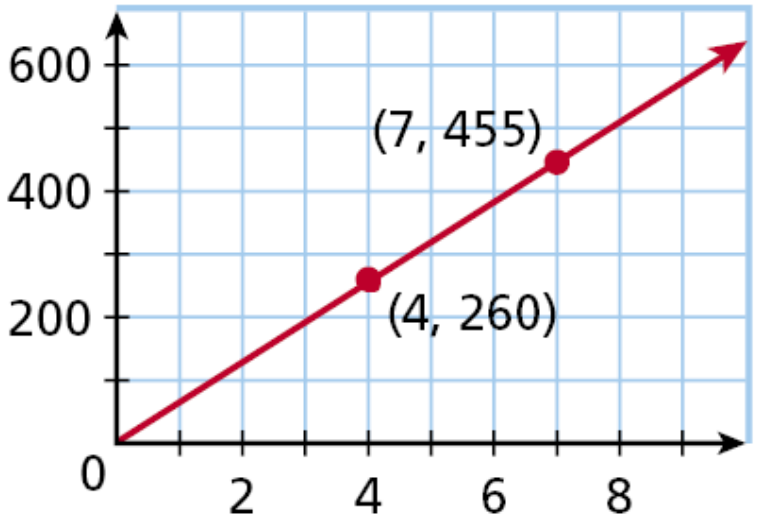
One interpretation of slope is a *rate of change*. If *y* represents miles traveled and *x* represents time in hours, the slope gives the rate of change in miles per hour.

Example 2: Transportation Application

Justin is driving from home to his college dormitory. At 4:00 p.m., he is 260 miles from home. At 7:00 p.m., he is 455 miles from home. Graph the line that represents Justin's distance from home at a given time. Find and interpret the slope of the line.

Use the points (4, 260) and (7, 455) to graph the line and find the slope.

$$m = \frac{455 - 260}{7 - 4} = \frac{195}{3} = 65$$



Homework:

WS 3.5 – Finding Slope