Name _____   Date _____

Using Similar Triangles to Find Slope - Guided Lesson Explanation

Explanation#1

The standard form for the equation of a line is Ax + By = C. A, B and C are real numbers and x and y are variables.

To find the equation of a line this formula is used:
$(y - y_2) = m(x - x_2)$
Both x and y remain variables. The slope, m, will be a real number as well as (x_2, y_2) Recall the formula for slope.

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

Find the slope of the line.

$$m = \frac{-2 - 3}{2 - (-2)} = \frac{-5}{4}$$

Substitute values into the formula.

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

Use the distributive property.

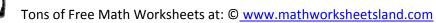$$y + 2 = \frac{-5}{4}x - \left(-\frac{5}{2}\right)$$

Use the addition property of equality to combine the constants, and to place x and its coefficient across the equal sign.

$$\frac{5}{4}x + y = \frac{5}{2} - 2$$

$$\frac{5}{4}x + y = \frac{1}{2}$$

Rearrange the equation to make it equal to y.

$$y = \frac{1}{2} - \frac{5}{4}x$$

Explanation#2

a. Slope is a ratio between the change in y and the change in x (y/x) (rise/run).

Both triangles rise 2 places (y) and run 2 places (x).

So the slope is 2/2 = 1.

b. The equation for a straight line is: $y = mx + b$

m = slope, b = y-intercept

The slope we determined is 1.

The Y intercept is where the line crosses the Y axis. Looking at the graph it crosses at -4. So the final equation will look like:

$y = 1x - 4$

Explanation#3

The standard form for the equation of a line is $Ax + By = C$. A, B and C are real numbers and x and y are variables.

To find the equation of a line this formula is used:
$(y - y_2) = m(x - x_2)$
Both x and y remain variables. The slope, m, will be a real number
as well as (x_2, y_2). Recall the formula for a slope.

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

Find the slope of the line.

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

Substitute values into the formula.

$$y = \frac{5}{3}x + b$$

We now need to find b. We can plug in an x and y from any of the known points. Let's use point 2, 2 because that will be easy to work with. We plug those values into the equation and solve for b:

$$2 = \frac{5}{3}2 + b$$

$$2 = \frac{10}{3} + b$$

$$b = 2 - \frac{10}{3}$$

$$b = -\frac{4}{3}$$

Putting this back into our equation, we get a complete equation of the line:

$$y = \frac{5}{3}x - \frac{4}{3}$$