Name_____

Objective: SWBAT Find the x or y value when the slope is given.

Warm up: Find the slope of the line that passes through the points.

1. $(-2,-1)$ *and* $(4,5)$
$x_1\ y_1 \qquad x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - -1}{4 - -2} = \frac{5+1}{4+2} = \frac{6}{6} = \boxed{1}$$

EXAMPLE 1: Find the value of x so that the line that passes through the points

(2, 3) and (x, 9) has a slope of $\frac{2}{3}$ $= m$
$x_1, y_1 \quad x_2\ y_2$

Let $(x_1, y_1) = (2, 3)$ and $(x_2, y_2) = (x, 9)$

Write the formula for slope:

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

And substitute

$$\frac{2}{3} = \frac{9-3}{x-2} \text{ (cross product) } \frac{2}{3} = \frac{6}{x-2}$$

Then solve for X.

$$3(6) = 2(x-2)$$
$$18 = 2x - 4$$
$$+4 \qquad +4$$
$$\frac{22}{2} = \frac{2x}{2}$$
$$\boxed{11 = x}$$

Example:

$(5,4)and(-5,y); m = \frac{3}{5}$
$x_1 y_1 \quad x_2 \; y_2$

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

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

$$5(y-4) = 3(-10)$$

$$\frac{3}{5} \times \frac{y-4}{-10} \Rightarrow 5y - 20 = -30$$

$$+20 \qquad +20$$

$$\frac{5y}{5} = \frac{-10}{5}$$

$$y = -2$$

Now you try……

$(x,4)and\ (6,-1); m = \frac{5}{6}$
$x_1 y_1 \quad x_2 \; y_2$

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

$$\frac{5}{6} = \frac{-1-4}{6-x} \Rightarrow \frac{5}{6} = \frac{-5}{6-x}$$

$$5(6-x) = -5(6)$$

$$30 - 5x = -30$$

$$-30 \qquad -30$$

$$\frac{-5x}{-5} = \frac{-60}{-5}$$

$$x = 12$$

More Examples:

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$(9,3)$ *and* $(-6,7y)$; $m = 3$ $\quad$ $(0,y)$ *and* $(-2,1)$; $m = -8$

$x_1\ y_1 \quad x_2\ y_2$

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

$$\frac{3}{1} = \frac{7y - 3}{-6 - 9} \quad (-6 + -9)$$

$$\frac{3}{1} = \frac{7y - 3}{-15}$$

$$3(-15) = 1(7y - 3)$$

$$-45 = 7y - 3$$

$$+3 \qquad +3$$

$$\frac{-42}{7} = \frac{7y}{7}$$

$$-6 = y$$