Bellwork

1. Identify the general equation for each of the given types of linear models:

   Slope-Intercept Form: $y = mx + b$

   Point-Slope Form: $y - y_1 = m(x - x_1)$

2. What does each of the variables represent?

   $x + y$ changing variables

   (x_1, y_1) specific point on the line

   m = slope b = y-intercept

Finding a Linear Equation

1. Label the given points as (x_1,y_1) and (x_2,y_2).

A. (-5,2) & (10,0) $x_1\ y_1 \quad x_2\ y_2$

B. (6,7) & (-6,-5) $x_1\ y_1 \quad x_2\ y_2$

2. Find the slope of the line connecting the two points together using the formula:

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

$$m = \frac{0-2}{10-(-5)}$$

$$m = \frac{-2}{15}$$

$$m = \frac{-5-7}{-6-6}$$

$$m = \frac{-12}{-12}$$

$$m = 1$$

3. Using the m that you just found, write the equation y = mx + b filling in for the m.

$y = \frac{-2}{15}x + b$ $\quad y = 1x + b$

4. Choose one of the points you were given and plug it in for the x and y in the problem.

Given (-5, 2) + (10, 0)

Given (6, 7) + (-6, -5)

$0 = \frac{-2}{15}(10) + b$

$0 = \frac{-20}{15} + b$

$0 = -\frac{4}{3} + b$

$+\frac{4}{3} \quad +\frac{4}{3}$

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

$-5 = 1(-6) + b$

$-5 = -6 + b$

$+6 \quad +6$

$1 = b$

5. Solve for b.

6. Rewrite y = mx + b now filling in JUST the m and the b values that we have found throughout the process.

$y = \frac{-2}{15}x + \frac{4}{3}$

$y = 1x + 1$

or

$y = x + 1$

HW Answers Day 1:

① $(-15, -6)$ & $(9, 0)$

$x_1\ y_1$ $\quad$ $x_2\ y_2$

$$m = \frac{0-(-6)}{9-(-15)}$$

$$m = \frac{6 \div 6}{24 \div 6} = \frac{1}{4}$$

$$y = \frac{1}{4}x + b$$

$$0 = \frac{1}{4}\left(\frac{9}{1}\right) + b$$

$$0 = \frac{9}{4} + b$$

$$-\frac{9}{4} \quad -\frac{9}{4}$$

$$-\frac{9}{4} = b$$

$$\boxed{y = \frac{1}{4}x - \frac{9}{4}}$$

② $(45, 8)$ & $(10, 1)$

$x_1\ y_1 \qquad x_2\ y_2$

$$m = \frac{1-8}{10-45}$$

$$m = \frac{-7 \div -7}{-35 \div -7}$$

$$m = \frac{1}{5}$$

$$y = \frac{1}{5}x + b$$

$$1 = \frac{1}{5}(10) + b$$

$$1 = \frac{10}{5} + b$$

$$1 = 2 + b$$

$$-2 \quad -2$$

$$-1 = b$$

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

③ $(-3,-3)$ & $(4,7)$

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

$$m = \frac{10}{7}$$

$$y = \frac{10}{7}x + b$$

$$-3 = \frac{10}{7}\left(\frac{-3}{1}\right) + b$$

$$-3 = \frac{1 \cdot -30}{7} + b$$

$$+\frac{30}{7} \quad +\frac{30}{7}$$

$$b = \frac{9}{7}$$

$$\frac{-3 \cdot 7}{1 \cdot 7} \quad \frac{-21}{7}$$

$$+\frac{30 \cdot 1}{7 \cdot 1} + \frac{30}{7}$$

$$y = \frac{10}{7}x + \frac{9}{7}$$