Find the slope between the following pairs of points:

$x_1\ y_1\qquad x_2\,y_2$

1. $(3, -4)$ and $(-5, 8)$
2. $(-10, 3)$ and $(6, -1)$

Bellwork

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

$$m = \frac{8 - -4}{-5 - 3} = \frac{12}{-8} = -1.5$$
$$\text{OR}$$
$$\frac{-3}{2}$$

$$m = \frac{-1 - 3}{6 - -10} = \frac{-4}{16} = \frac{-1}{4}\ \text{OR} -0.25$$

8/25 How do I write equations of lines?

Point-Slope
(x_1, y_1) m

$$y - y_1 = m(x - x_1)$$

$\blacksquare$ = will be numbers

Ex. Write the equation of the line in point-slope form that passes through $(-2, 3)$ & has a $m = -\frac{4}{5}$.

x_1 y_1

$$y - y_1 = m(x - x_1)$$

$$y - 3 = -\frac{4}{5}(x - {}^-2)$$

$$\boxed{y - 3 = -\frac{4}{5}(x + 2)}$$

Ex.#2 $(-4, -7)$ $m = -1$

Point-slope

$$y - {}^-7 = -1(x - {}^-4)$$

$$y + 7 = -1(x + 4)$$

Ex.#3 $(2, -3)$ $m = -\frac{1}{2}$

$$\overset{x_1 \quad y_1}{y + 3 = -\frac{1}{2}(x - 2)}$$

$$y = mx + b$$

slope - intercept

→ Distribute $-\frac{1}{2}$

$$y + 3 = -\frac{1}{2}x + 1$$

$$\frac{-3 \qquad -3}{y = -\frac{1}{2}x - 2}$$

Ex. Write in slope-intercept.

$m = 3 \qquad (-1, -5)$.

<u>START</u> w/ point-slope!

$$y + 5 = 3(x + 1)$$

Distribute 3

$$y + 5 = 3x + 3$$
$$\underline{\quad -5 \qquad\qquad -5\quad}$$

$$\boxed{y = 3x - 2}$$

Ex. Write in slope-intercept form: $m = \frac{-1}{3}$ $(-6, 4)$.

$$y - 4 = -\frac{1}{3}(x + 6)$$

Distribute $\frac{-1}{3}$

$$y - 4 = \frac{-1}{3}x - 2$$
$$+4 \qquad\qquad +4$$

$$\boxed{y = \frac{-1}{3}x + 2}$$

Ex. Write in slope-intercept form:

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

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

Ex. Write in slope-intercept
form:
$(3, -3)$ $(-3, -5)$

1st Find Slope

$$\frac{-5 - -3}{-3 - 3} = \frac{-2}{-6} = \frac{1}{3}$$

$$y + 3 = \frac{1}{3}(x - 3)$$

$$y + 3 = \frac{1}{3}x - 1$$

$$\underline{\quad -3 \qquad\qquad -3 \quad}$$

$$\boxed{y = \frac{1}{3}x - 4}$$

8-25: How do I write equations of lines?

$$y = mx + b$$ slope-intercept form

$x = 1$ is an example of a vertical line

$y = 1$ is an example of a horizontal line

$$y - y_1 = m(x - x_1)$$

Point-Slope Form

$$m \quad (x_1, y_1)$$

Ex. Write in point-slope form:

$$m = -2 \qquad (\overset{x_1}{-3}, \overset{y_1}{5})$$

$$y - 5 = -2(x - -3)$$

$$y - 5 = -2(x + 3)$$

Ex. Write in point-slope
form: $(\overset{x_1}{4}, \overset{y_1}{-3})$ $m = \frac{1}{2}$.

$$y - -3 = \frac{1}{2}(x-4)$$

$$y + 3 = \frac{1}{2}(x-4)$$

$$y + 3 = \frac{1}{2}x - 2$$
$$ -3 \phantom{= \frac{1}{2}x} -3$$
$$\overline{}$$
$$y = \frac{1}{2}x - 5 \quad \text{slope intercept}$$

Ex. $m = \frac{-2}{3}$ $(\overset{x_1}{-6}, \overset{y_1}{-1})$

① point-slope
② slope intercept
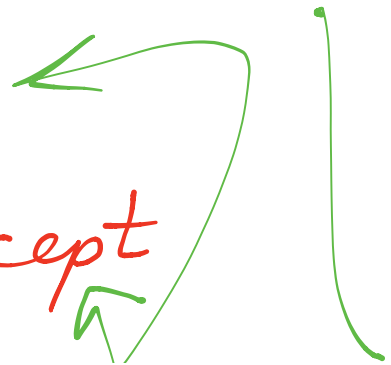
$$y + 1 = \frac{-2}{3}(x + 6)$$

Distribute $-2/3$

$$y + 1 = \frac{-2}{3}x - 4$$
$$-1 \qquad\qquad -1$$

$$\boxed{y = \frac{-2}{3}x - 5}$$

You try:

① point slope and slope-int

$$m = 3 \qquad (-2, 5)$$

② point slope & slope intercept

$$(-1, 1) \qquad (4, -4)$$

① $y - 5 = 3(x + 2)$ Distribute 1st!

$y - 5 = 3x + 6$

$y = 3x + 11$

② $m = \dfrac{-4 - 1}{4 - -1} = \dfrac{-5}{5} = -1$

$y - 1 = -1(x + 1)$

$y - 1 = -1x - 1$
$+1 \qquad\qquad +1$

$y = -1x$