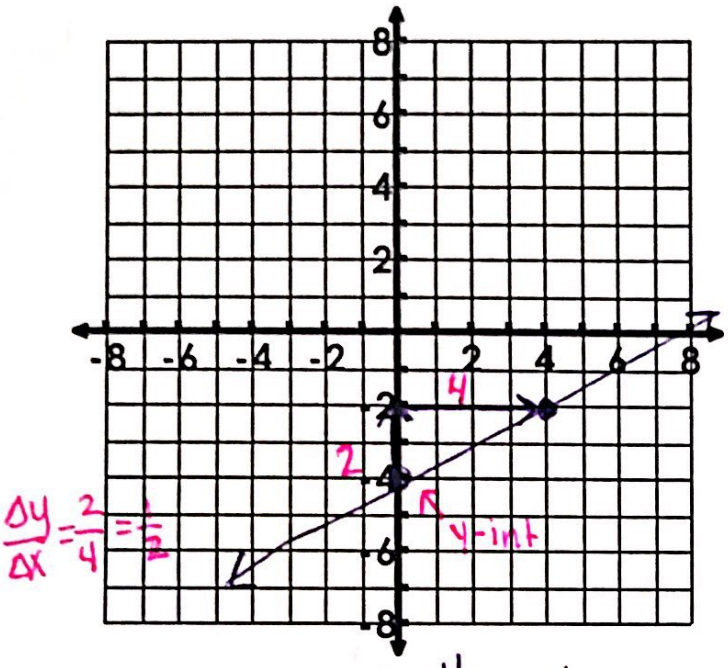
Day 10 – Writing Equations of Lines (2 points) – Notes

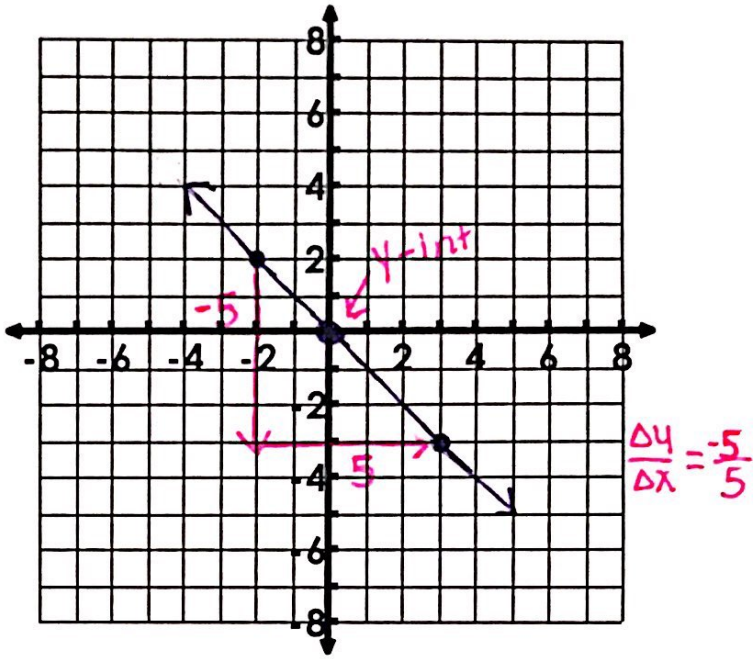
Explore: For each of the following problems, write the equation of the line using the given parameters (two points on the line).

a. (4, -2) and (0, -4)



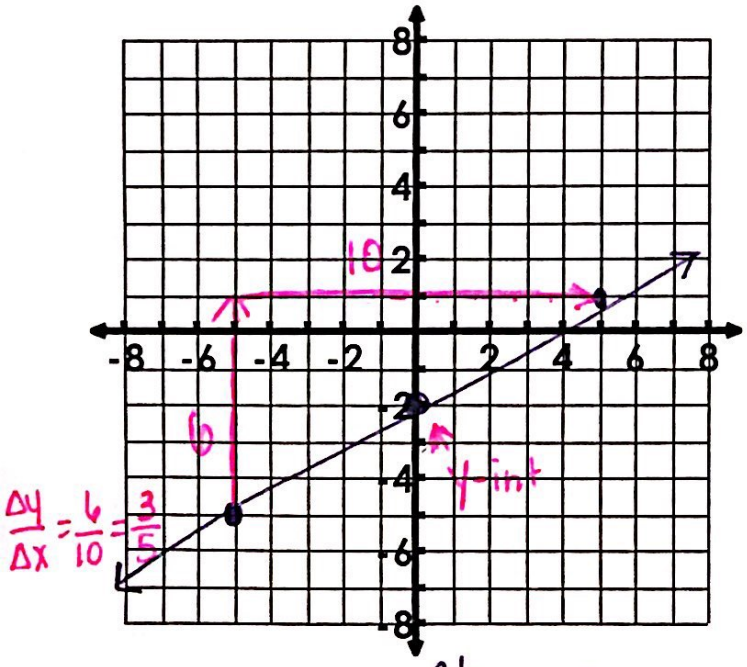
Equation of the Line: $y = \frac{1}{2}x - 4$

b. (-2, 2) and (3, -3)



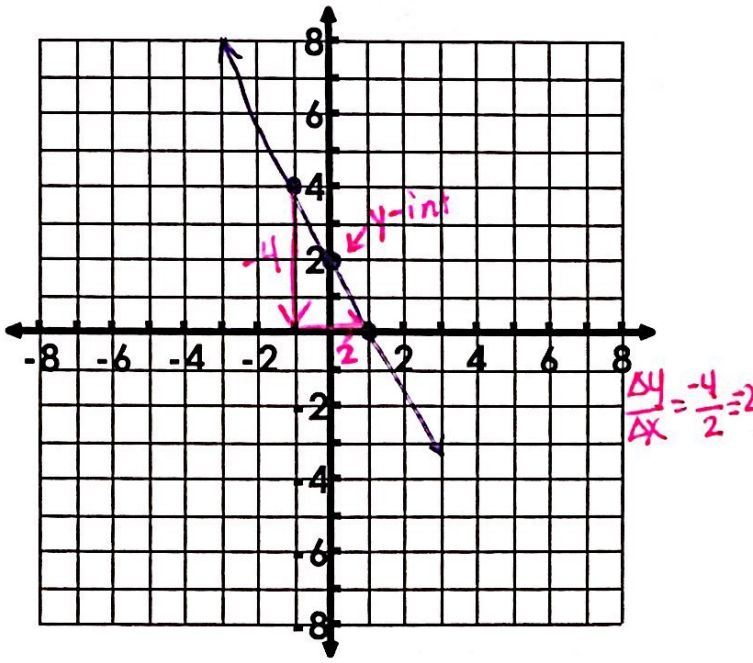
Equation of the Line: $y = -x$

c. (5, 1) and (-5, -5)



Equation of the Line: $y = 3/5\,x - 2$

d. (-1, 4) and (1, 0)



Equation of the Line: $y = -2x + 2$

Writing Equations of Lines Given Two Points

Writing Equations Using Slope Intercept Form $y = mx + b$		**Writing Equations Using Point Slope Form** $(y - y_1) = m(x - x_1)$	
1. Calculate the slope using the slope formula. 2. Write the formula $y = mx + b$. 3. Substitute the value of the slope in for *m* and the value of the point in for x and y. 4. Solve the equation for *b*. 5. Substitute the value of *m* and the newly founded *b* into $y = mx + b$.	$(15,-13)$ $(5,27)$ $m = \frac{27 - -13}{5 - 15} = \frac{40}{-10} = -4$ $y = mx + b$ $27 = -4(5) + b$ $27 = -20 + b$ $+20 \quad +20$ $47 = b$ $y = -4x + 47$	1. Calculate the slope using the slope formula. 2. Write the formula $(y - y_1) = m(x - x_1)$. 3. Substitute the value of the slope in for *m* and the value of the point in for x_1 and y_1. 4. Solve the equation for y	$m = -4$ $y - y_1 = m(x - x_1)$ $y - 27 = -4(x - 5)$ $y - 27 = -4x + 20$ $+27 \quad +27$ $y = -4x + 47$

Ex 1: Write the equation of a line given points (15, -13) and (5, 27).

See example problem

m = _____ b = _____

Equation: _____

Ex 2: Write the equation of a line given points (6, 19) and (0, -35). ← y-int

$m = \frac{-35 - 19}{0 - 6} = \frac{-54}{-6} = 9$

Solving for b is not necessary

m = 9 b = (0, -35)

Equation: $y = 9x - 35$

Ex 3: Write the equation of a line given points (1, -4) and (3, 2).

$m = \frac{2 - -4}{3 - 1} = \frac{6}{2} = 3$

$y = mx + b$
$-4 = 3(1) + b$
$-4 = 3 + b$
$-3 \quad -3$
$-7 = b$

m = 3 b = -7

Equation: $y = 3x - 7$