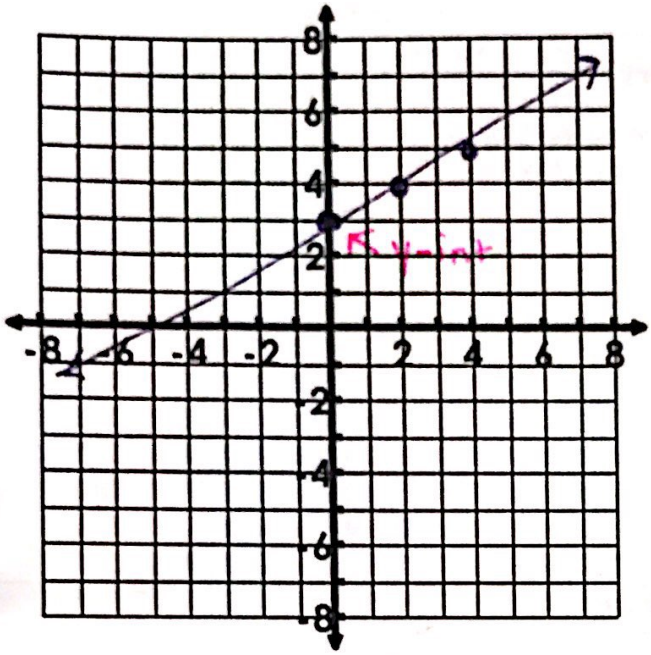
Day 9 – Writing Equations of Lines (Slope & Point) – Notes

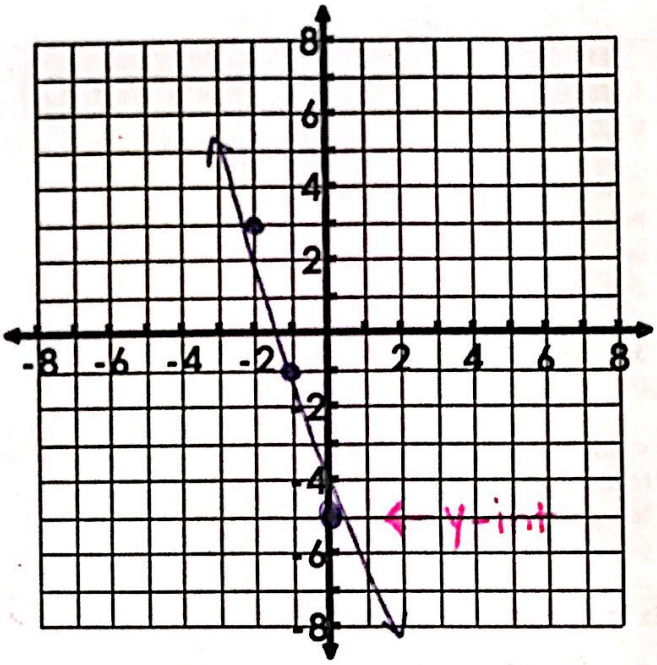
Explore: For each of the following problems, write the equation of the line using the given parameters (slope and a point on the line).

a. m = ½, point (0, -3)



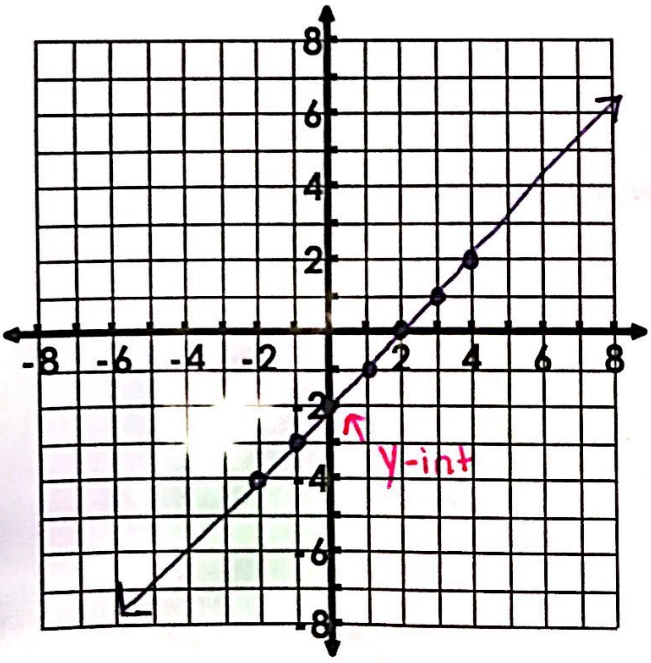
Equation of the Line: $y = \frac{1}{2}x - 3$

b. m = -4, point (-2, 3)



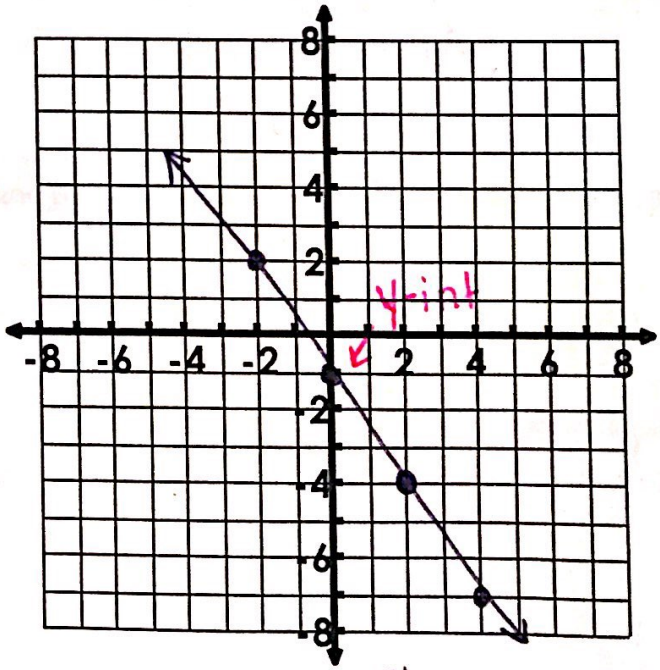
Equation of the Line: $y = -4x - 5$

c. m = 1, point (4, 2)



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

d. m = -3/2, point (2, -4)



Equation of the Line: $y = -\frac{3}{2}x - 1$

Writing Equations of Lines Given Slope & a Point

So far in Unit 5, you have been able to determine the y-intercept from either a graph or an equation in slope intercept form. How will you find the y-intercept or equation of a line without a graph or equation? You can use the slope intercept form to find the y-intercept or equation of a line if you know the slope and a point on the line.

Writing Equations Using Slope Intercept Form $y = mx + b$		**Writing Equations Using Point Slope Form** $(y - y_1) = m(x - x_1)$	
m=9 (2,11) (x y) 1. Write the formula $y = mx + b$. 2. Substitute the value of the slope in for *m* and the value of the point in for x and y. 3. Solve the equation for *b* Substitute the value of *b* and the newly founded *b* into $y = mx + b$.	$y=mx+b$ $11=9(2)+b$ $11=18+b$ $-18\ \ -18$ $-7=b$ $y=9x-7$	$m=9$ $(2,11)$ (x_1, y_1) 1. Write the formula $(y - y_1) = m(x - x_1)$. 2. Substitute the value of the slope in for *m* and the value of the point in for x_1 and y_1. 3. Solve the equation for y	$y-11=9(x-2)$ $y-11=9x-18$ $+11\ \ \ +11$ $y=9x-7$

Ex 1: Write the equation of a line with a slope of -3 and y-intercept of 2. (m, b) $y=-3x+2$

Ex 2: Write the equation of a line if m = 9 and passes through the point (2, 11).

See example above

m = _____ b = _____

Equation: _____

Ex 3: Write the equation of a line with m = -8 and passes through the point (3, 12). (x y)

$y=mx+b$
$12=-8(3)+b$
$12=-24+b$
$+24\ \ +24$
$36=b$

m = -8 b = 36

Equation: $y=-8x+36$

Ex 4: Write the equation of a line with m = 4 and passing through the point (2, 5). (x y)

$y=mx+b$
$5=4(2)+b$
$5=8+b$
$-8\ \ -8$
$-3=b$

m = 4 b = -3

Equation: $y=4x-3$