NOTES UNIT 1B Graphing Linear Equations Name: _____HR:_____

Lesson 3

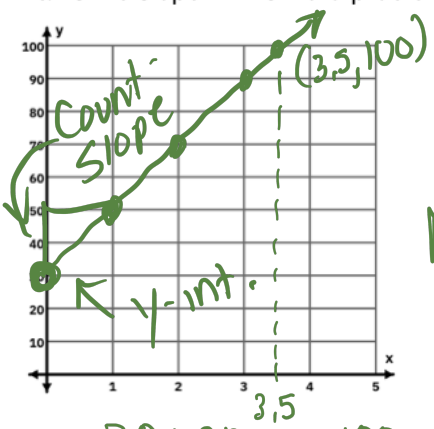
Target Skills: Be able to graph the described line on an coordinate axis.

In geometry, how many points does it take to define a line? 2

Example: You have $30 in your savings account. You have a job that pays you $20 per hour. How many hours will you have to work to buy a $100 concert ticket?

$3.5(20) = 70 + 30 = \$100$

What is the slope in this word problem? (Which value is a rate of change?



h = Number of Hours

M = Money we Save

Initial Amount: $30

Rate of Change: $20 / 1hr

This will be The x variable

Equation: $M = 30 + 20h$ ← variable Always next to slope/Rate of Change

Function Notation: $M(h) = 30 + 20h$

$30 + 20h = 100$
$-30 \quad -30$
$\frac{20h}{20} = \frac{70}{20}$
$h = 3.5$ hrs

wher Line Crosses y-Axis

Y-intercept: $(h, M) = (0, 30)$

Slope:

Linear Equations (Equations that when graphed make straight lines), have 3 main forms.

The 3 Forms a Linear Equation can be written in.

Slope-Intercept form:	Standard Form:	Point-Slope Form:
$y = 20x + 30$ $y = mx + b$ m = slope b = y-int. Or $f(x) = mx + b$ 😎 GREAT for GRAPHING 😎 GREAT for finding (x, y) points	Ax + By = C 😎 OK for GRAPHING IF C is divisible by both A and B 😎 GREAT for solving SYSTEMS of EQUATIONS 😎 2 easy steps to CHANGE into Slope-Intercept FORM (and then graph)	$y - y_1 = m(x - x_1)$ 😎 GREAT for finding the equation of a line. 😎 OK for GRAPHING 😎 2 steps to TURN into SLOPE-INTERCEPT form (and then graph)

Graphing with SLOPE-INTERCEPT FORM: $y = mx + b$

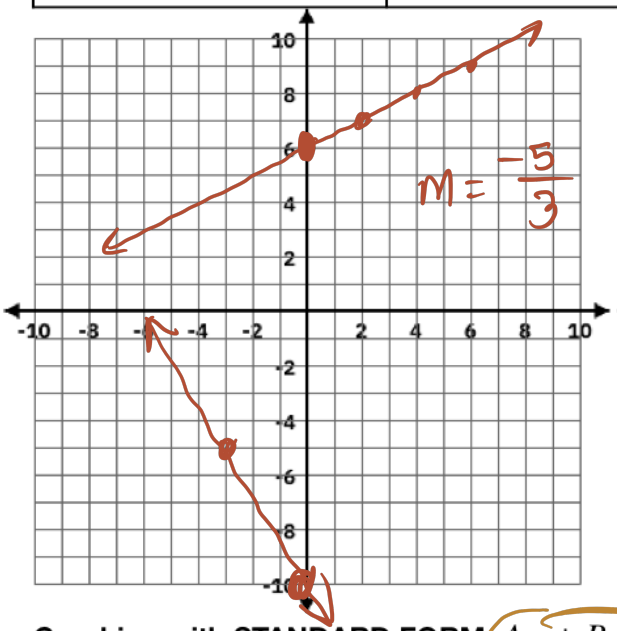
$y = mx + b$

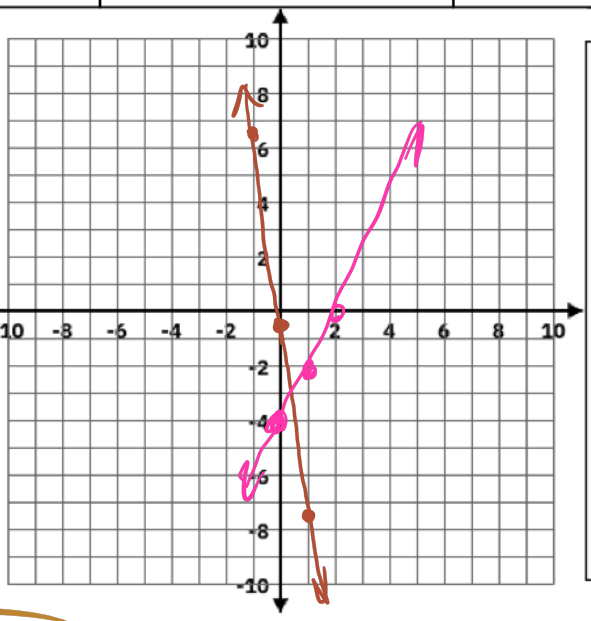
Directions: Write the slope and the y-intercept for each of the following:

$y = \frac{1}{2}x + 6$	$f(x) = -\frac{5}{3}x - 10$	$f(x) = \frac{1}{2} - 7x$	$3y - 6x = -12$
$y = mx + b$ $m = \frac{1}{2}$ $b = 6$	$m = -\frac{5}{3}$ $b = -10$	$f(x) = -7x + \frac{1}{2}$ $m = -7$ $b = \frac{1}{2}$	$+6x \quad +6x$ $\frac{3y}{3} = \frac{6x}{3} - \frac{12}{3}$ $y = 2x - 4$ $m = 2 \quad b = -4$

Graphing Linear Equations Name: _____ HR: _____

$y = \frac{1}{2}x + 6$	$f(x) = -\frac{5}{3}x - 10$	$f(x) = -7x - \frac{1}{2}$	$y = 2x - 4$
m = y-change / x change; $m = \frac{1}{2}$; b = 6 ← y-axis	$m = \frac{-5}{3}$; $b = -10$	$m = -7 = \frac{-7}{1}$; $b = -\frac{1}{2}$	slope = rise/run; $y = mx + b$; y-intercept





Negative Slope Help

$$m = -\frac{3}{2}$$

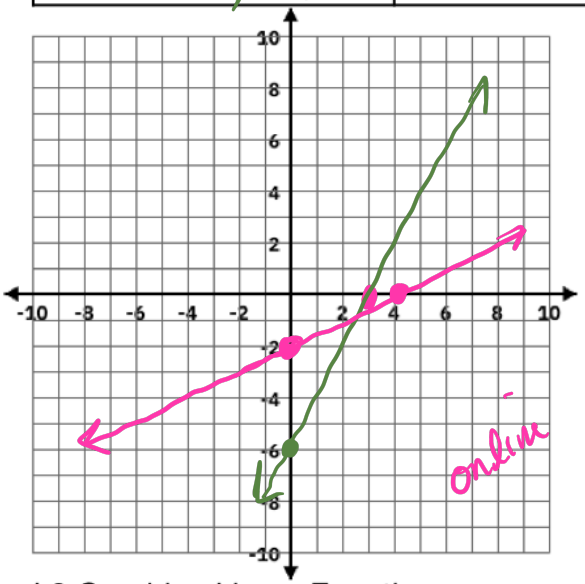
Is the same as

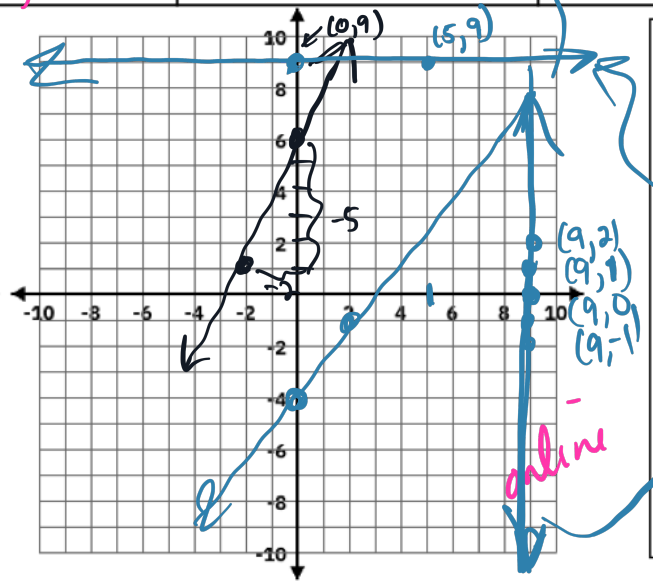
$$m = \frac{-3}{2}$$

Count Down 3 & right 2

Graphing with STANDARD FORM $Ax + By = C$ **A, B, and C are integers, A > 0**

Finding x and y intercepts	Finding x and y intercepts	Changing to slope-intercept form	Changing to slope-intercept form
No Exponents – Line; $Ax + By = C$; $4x - 2y = 12$; x-intercept: Let y = 0; $4x - 2(0) = 12$; $\frac{4x}{4} = \frac{12}{4}$; $x = 3$ (3,0); y-int: Let x = 0; $\frac{-2y}{-2} = \frac{12}{-2}$; $y = -6$ (0,-6)	$6x - 12y = 24$; y = 0; $\frac{6x}{6} = \frac{24}{6}$; $x = 4$ (4,0); x = 0; $\frac{-12y}{-12} = \frac{24}{-12}$; $y = -2$ (0,-2)	$y = mx + b$; $3x - 2y = 8$; $-3x$; $-2y = -3x + 8$; $\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{8}{-2}$; $y = \frac{3}{2}x - 4$	$5x - 2y = -12$; $-5x$; $\frac{-2y}{-2} = \frac{-5x}{-2} - \frac{12}{-2}$; $y = \frac{5}{2}x + 6$





Special Lines

Horizontal Lines: m = 0

$y = 9$

(0,9)(1,9)

Vertical Lines: m = Undefined

$x = 9$