Guided Notes 4.6/4.7

VOCABULARY

1. The linear equation y = mx + b is written in **slope-intercept form.** The slope of the line is m. The y-intercept is b.

Find the slope and y- intercept of the graph of the equation

Equation	Slope	y-intercept
y = 2x + 1	2	1
y = -2x – 3	-2	-3
y = x + 4	1	4
y = 0.5x – 2.5	.5	-2.5

Writing equations in Slope-Intercept Form

To write an equation in slope-intercept form we want to have one side be y and everything else on the other side, y = stuff.
Write the following equations in slope-intercept form, identify the slope and the y-intercept.

Equation	Slope-Intercept form	Slope	y-Intercept
y = -x + 2	$y=-x+2$	-1	2
$y=\frac{x+3}{2}$	$y=\frac{1}{2}x+\frac{3}{2}$	$1/2$	$3/2$
y = -4	$y=0x-4$	0	-4
2x – 4y = 16	$y=\frac{1}{2}x-4$	$\frac{1}{2}$	-4

$-2x \quad -2x$

$$\frac{-4y}{-4}=\frac{-2x+16}{-4}$$

$$y=\frac{-2x+16}{-4}$$

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

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

Graphing Using Slope and Intercept

$\frac{2}{4}$

To graph a linear equation using the slope and the intercept we:

1. WRITE the equation in slope-intercept form.
2. FIND the slope and the y-intercept.
3. PLOT plot the point (0, b) ← y-intercept
4. DRAW draw a slope triangle to locate a second point
5. DRAW draw a line through the two points

$3 = \frac{3}{1}$

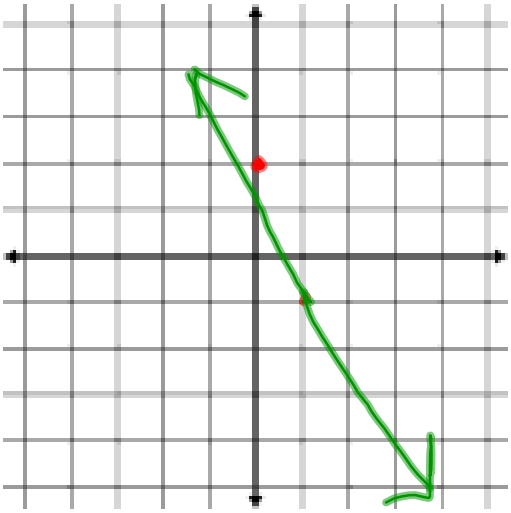
$-4 = \frac{-4}{1}$

$\frac{2}{3}$

Example 1: Graph the equation $3x + y = 2$ $-3x$ $-3x$

$y = 2 - 3x$

Slope: $\frac{-3}{1}$ Yint: 2



VOCABULARY:

Two different lines are parallel if they do not intersect.

Any two Vertical lines are parallel. Any two non-vertical lines are parallel if and only if they have the Same Slope.

Example 2: Which of the following lines are parallel?

A: $-x + 2y = 6$

$+x \quad +x$

$\frac{2y}{2} = \frac{x+6}{2}$

$y = \frac{x+6}{2}$

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

$\boxed{\frac{1}{2}}$

B. $-x + 2y = -2$

$+x \quad +x$

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

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

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

$\boxed{\frac{1}{2}}$

C. $x + 2y = 4$

$-x \quad -x$

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

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

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

$\boxed{-\frac{1}{2}}$

Steps for solving a Linear Equation Graphically

1. Write the equation in the form mx + b = 0

$2x-3=4$ $2x-7=0$

2. Write the related function y = mx + b

$y=2x-7$

3. Graph the equation y = mx + b

Slope: 2 Yint: -7

4. The solution of mx + b = 0 is the x-intercept

of y = ax + b

Example 3: Solve 2x – 5 = 1 algebraically. Check your solution graphically.

$2x-5=1$

$+5 \quad +5$

$\frac{2x}{2}=\frac{6}{2}$

$x=3$

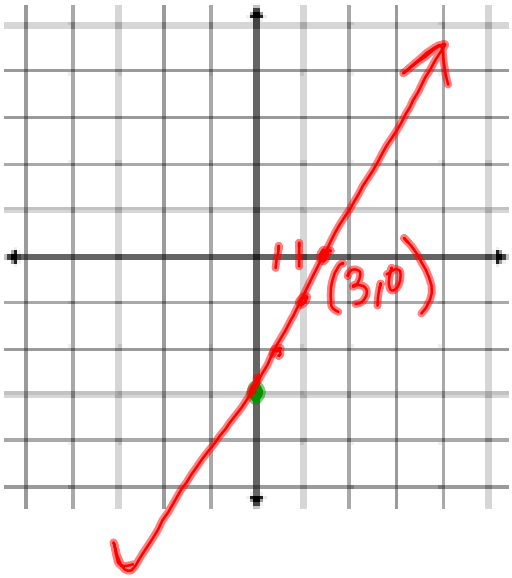
$2x-5=1$

$-1 \quad -1$

$2x-6=0$

$y=2x-6$

$\frac{2}{1} \quad -6$



Example 4: Solve the equation graphically then check your solution algebraically. $2x - 7 = -5$

$+5 \quad +5$

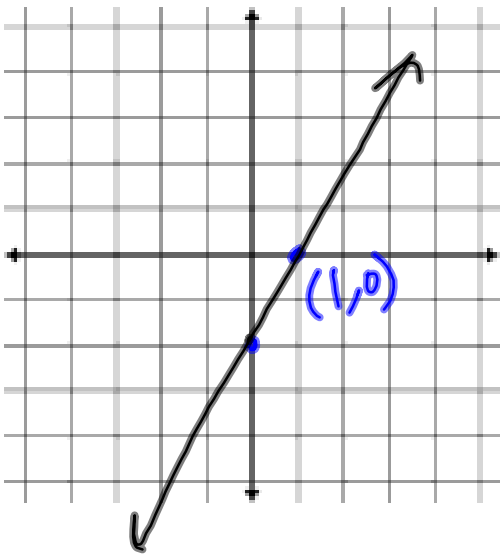
$2x - 2 = 0$

$y = 2x - 2$

Related function

$m = 2$

$b = -2$



$x = 1$

$2(1) - 2 = 0$

$2 - 2 = 0$

$0 = 0$ ✓