Name:_____   Date:_____

Notes
Algebra Section 4.5
Pages 244-250

Goal: "You will graph linear equations using slope-intercept form"

Slope-Intercept Form:

$$y = mx + b$$

m is the slope. It is the coefficient of x

b is the y-intercept. It is always being added

or subtracted.

Identify slope and y-intercept.

1) $y = 3x + 4$

Slope: 3

y-intercept: 4

2) $y = 3x + 2$

Slope: 3

y-intercept: 2

3) $y = 5x - 3$

Slope: 5

y-intercept: -3

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

Slope: $\frac{1}{3}$

y-intercept: -4

5) $y = -6x + 2$

Slope: -6

y-intercept: 2

6) $x + 3 = y$

Slope: 1

y-intercept: 3

7) $\frac{2}{5}x = y$

Slope: $\frac{2}{5}$

y-intercept: 0

8) $y = x - 8$

Slope: 1

y-intercept: -8

9) $4 - x = y$

Slope: -1

y-intercept: 4

10) $4 - \frac{5}{8}x = y$

Slope: $-\frac{5}{8}$

y-intercept: 4

To Graph a Line in Slope-Intercept Form:

1) Identify _m_ and _b_ . Be sure slope is written as a <u>fraction</u> so you can identify the <u>rise</u> and <u>run.</u> Notice if the <u>slope</u> is positive or negative.

2) Plot the <u>y-intercept.</u>

3) Always rise first. Run to the <u>right</u> if the slope is <u>positive.</u> Run to the <u>left</u> if the slope is <u>negative.</u>

4) Plot <u>several</u> points and connect with a <u>ruler.</u>
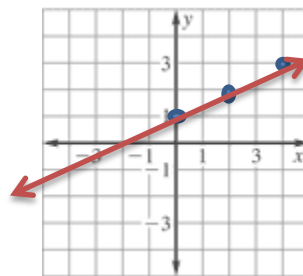
<u>**Graph using slope – intercept form**</u>:
Example:

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

Step 1: Identify the _m_ and _b_. $m = \frac{1}{2}$ _b=1_

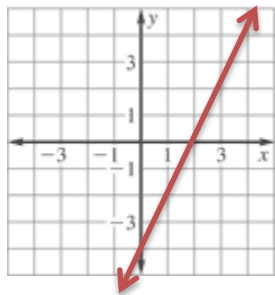Step 3: Plot the _y_-intercept and rise.

Step 4: Run right if + and left if -.
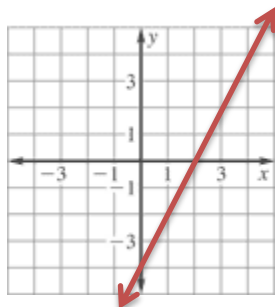
Step 5: Plot several points and connect.
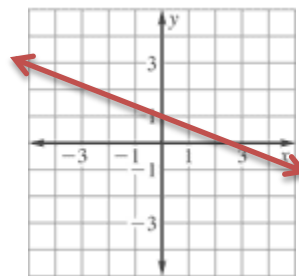

Try These:

1) $y = 2x - 4$

2) $y = -\frac{2}{5}x + 1$

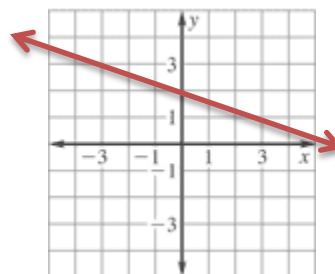**3)** $2x - 4 = y$

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

Special Slopes:

Parallel Lines: They have the same <u>slope.</u> If two lines are <u>parallel</u> they are <u>increasing</u> or <u>decreasing</u> at the same <u>rate,</u> and therefore will never <u>intercect,</u> making them <u>parallel</u> <u>lines.</u>
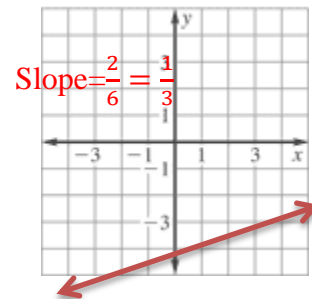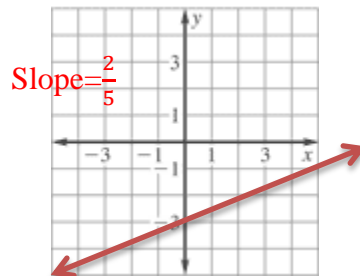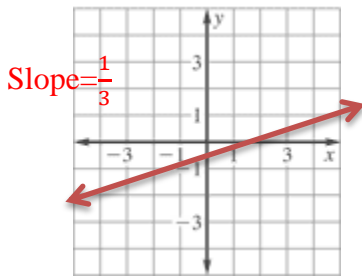
To determine if two lines are parallel: Find the slope of each line.

Line *A* passes through the points (–1, –1) and (2, 0)
Line *B* passes through the points (0, –3) and (5, –1)
Line *C* passes through the points (–2, –5) and (4, –3)

Find the slope of each line by graphing.

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

Which two lines, if any, are parallel?

Line A and Line C are parallel because they have the same slope $\frac{1}{3}$

Decide if the given lines are parallel. State why or why not.

1) $y = 3x + 7$

$y = \frac{1}{3}x + 7$

No. The slopes are different

3 and $\frac{1}{3}$

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

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

Yes. They both have slopes of $\frac{1}{2}$