

## Equations for a Line

- Slope-Intercept Form  $y = mx + b$
- Standard Form  $Ax + By = C$
- Point-Slope Form  $y - y_1 = m(x - x_1)$

For 1-6, write the equation of each line.

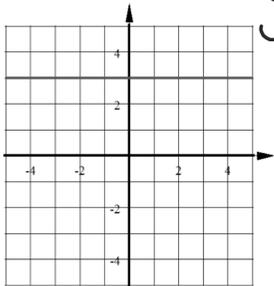
1. The line has a slope of zero and passes through the point  $(9, -7)$

$$y + 7 = 0(x - 9) \quad y = -7 \quad \uparrow$$

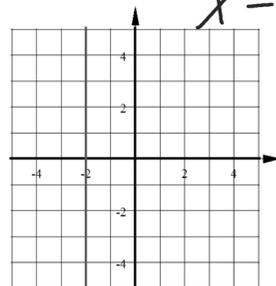
2. The line passes through the points  $(2, -4)$  &  $(1, -4)$   $m = 0$

$$y = -4$$

3. The line in the graph below:



4. The line in the graph below:



5. The line passes through the points  $(11, -8)$  &  $(11, 3)$

$$x = 11$$

6. The line has an undefined slope and passes through  $(1, 2)$

$$x = 1$$

For 7 and 8, find the the x and y intercepts of each equation. Give answer as a reduced fraction if you must round the decimal or it is repeating..

7.  $10x - 4y = 40$

x-int=

$$10x = 40$$

$$x = 4$$

y-int=

$$-8y = 40$$

$$y = -5$$

8.  $9x + \frac{1}{2}y = 16$

x-int=

$$9x = 16$$

$$x = \frac{16}{9}$$

y-int=

$$12y = 16$$

$$y = \frac{4}{3}$$

9. Write this equation in Slope-Intercept Form:  $-15x - 20y = 40$

$$+15x + 15x$$

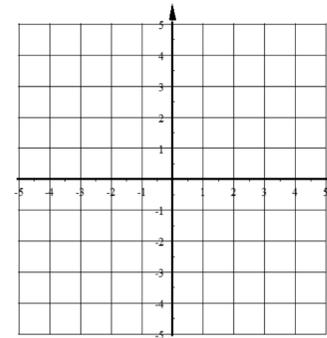
$$y = -\frac{3}{4}x - 2$$

$$\frac{-20y}{-20} = \frac{40 + 15x}{-20}$$

### Section 6-3: Standard Form of a Linear Equation

$$Ax + By = C$$

A, B, and C are real numbers  
Both A and B can't be zero.



What is true about EVERY point on the y-axis?

the x-coordinate is zero

What is true about EVERY point on the x-axis?

the y-coordinate is zero

The y-intercept of a line is where the line intersects the y-axis.  
It is where  $x = 0$ .

Given this equation:

~~$4x + 6y = 24$~~   
 $6y = 24$   
 $y = 4$

Find the y-intercept.

Find the x and y intercepts of each line.

1.  $10x - 4y = 20$

x-int:  $10x - 4(0) = 20$  y-int:  $10(0) - 4y = 20$

$10x = 20$

$-4y = 20$

$\frac{10x}{10} = \frac{20}{10}$

$\frac{-4y}{-4} = \frac{20}{-4}$

$x\text{-int} = 2$

$y\text{-int} = -5$

2.  $-12x + 8y = -28$

x - int =  $-28/-12 = 7/3$

y - int =  $-28/8 = -7/2$

3.  $x + y = 9$

x - int =  $9/1 = 9$

y - int =  $9/1 = 9$

In general: Given the equation  $Ax + By = C$

x-int =  $\frac{C}{A}$

y - int =  $\frac{C}{B}$

Write the equation of the line that passes through this pair of points. Give your answer in Slope-Intercept Form

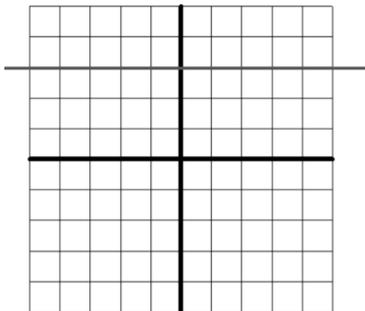
(4, 1) and (-7, 1)

$y = 1$

EQ:  $y = 1$  This is  $Ax + By = C$  when  $A = 0$

Whenever  $A = 0$  the line is Horizontal

What is true about every point on this line?



They all have the same y-coordinate

What is the slope? **zero**

What is the y-intercept? **3**

What is the equation?

$$y = 3$$

The equation of every horizontal line:

$$y = \#$$

This number is the y-intercept or the y-coordinate of any point on the line.

Write the equation of the line that passes through this pair of points.

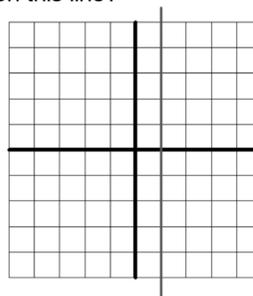
**(3, 5) and (3, -2)**

EQ:  $x = 3$  This is  $Ax + By = C$  when  $B = 0$

Whenever  $B = 0$  the line is **Vertical**

A vertical line is the only line that can't be written in Slope-Intercept Form

What is true about every point on this line?



They all have the same x-coordinate

What is the slope? **undefined**

What is the y-intercept?  
**There is no y-int**

What is the equation?  
 $x = 1$

The equation of every vertical line:

$$x = \#$$



This number is the x-intercept or the x-coordinate of any point on the line.

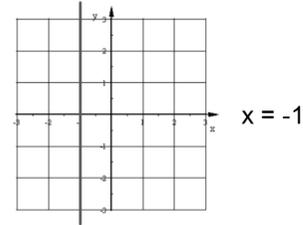
What is the equation of each line?

1. Passes through (-8, -4) and (11, -4)

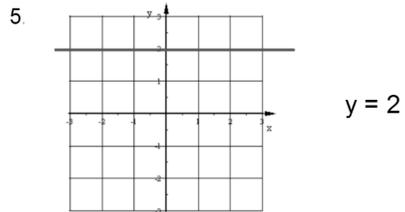
$$y = -4$$

2. Slope is zero and the line passes through the point (-4, 1)  $y = 1$

3.



4. Slope is undefined and the line passes through the point (-9, 0)  
 $x = -9$



6. Passes through (32, -9) and (32, 47)  $x = 32$

Standard Form:  $Ax + By = C$

A, B, and C should be Integers

Write each equation into Standard Form:

1.  $y = -2x + 8$

$$+2x + 2x + y = 8$$
$$2x + y = 8$$

2.  $y = \frac{2}{3}x - 11$

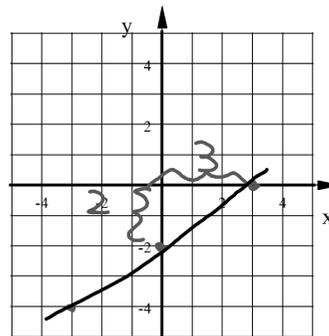
$$-\frac{2}{3}x + y = -11$$

Write this equation in Slope-Intercept Form:

$$12x - 8y = 40$$
$$y = mx + b$$
$$\frac{-8y}{-8} = \frac{-12x + 40}{-8}$$
$$y = \frac{3}{2}x - 5$$

Graphing lines in Standard Form:

$$8x - 12y = 24$$



$$x \text{ int: } 8x = 24$$
$$x = 3$$
$$y \text{ int: } -12y = 24$$
$$y = -2$$

You can now finish Hwk #39

Sec 6-3

Pages 301-302

Problems 5-8, 10, 11, 19, 20, 36, 37, 49, 50

For 49 & 50 write eq in Slope-Intercept Form only

IXL #15 - S.4 & S.21 due Friday at 4pm!