

## Warm Up

2/16

Find the slope, x-intercept, and y-intercept for the following equation:

$$7x + 3y = 21$$

$$\begin{array}{r} -7x \qquad -7x \\ \hline 3y = \frac{-7x + 21}{3} \end{array} \rightarrow \text{slope}$$
$$y = \left(-\frac{7}{3}\right)x + (7) \rightarrow (0, 7)$$

Let's find x-intercept:

$$7x + 3y = 21$$

$$7x + 3(0) = 21$$

$$\frac{7x}{7} = \frac{21}{7} \quad (3, 0)$$

$$x = 3$$

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

$$0 = -\frac{7}{3}x + 7$$

$$\begin{array}{r} +\frac{7}{3}x \quad +\frac{7}{3}x \\ \hline \end{array}$$

$$\left(\frac{3}{7}\right) \frac{7}{3}x = 7 \left(\frac{3}{7}\right)$$

$$x = 3$$

	Equation	x-intercept	y-intercept	Slope
9.	$4x - y = 2$	$(\frac{1}{2}, 0)$	$-2$	$4$
10.	$3x + y = 5$	$(\frac{5}{3}, 0)$	$(0, 5)$	$-3$
11.	$x - y = 7$	$(7, 0)$	$(0, -7)$	$1$
12.	$5x - y = -3$	$(-\frac{3}{5}, 0)$	$(0, 3)$	$5$
13.	$8x + y = -12$	$(-\frac{3}{2}, 0)$	$(0, -12)$	$-8$
14.	$9x + y = 5$	$(\frac{5}{9}, 0)$	$(0, 5)$	$-9$
15.	$y = -2x + 5$	$(\frac{5}{2}, 0)$	$(0, 5)$	$-2$
16.	$y = -2x - 3$	$(-\frac{3}{2}, 0)$	$(0, -3)$	$-2$
17.	$y = x - 4$	$(4, 0)$	$(0, -4)$	$1$
18.	$y = (-\frac{3}{4})x + 3$	$(4, 0)$	$(0, 3)$	$-\frac{3}{4}$
19.	$y = (\frac{7}{2})x - 8$	$(\frac{16}{7}, 0)$	$(0, -8)$	$\frac{7}{2}$
20.	$y = 0.2x - 11$	$(55, 0)$	$(0, -11)$	$0.2$

## Homework Questions?

Page 14, #'s 9-20

Write the equation in equivalent  $Ax + By = C$  form. Then, identify the  $x$ -intercept,  $y$ -intercept, and slope.

9.  $y = 4x - 2$

10.  $y = -3x + 5$

11.  $y = x - 7$

12.  $y = 5x + 3$

13.  $y = -8x - 12$

14.  $y = -9x + 5$

For Exercises 15–20, write the equation in  $y = mx + b$  form. Identify the  $x$ -intercept,  $y$ -intercept, and slope.

15.  $-2x - y = -5$

16.  $6x + 3y = -9$

17.  $x - y = 4$

18.  $3x + 4y = 12$

19.  $-7x + 2y = -16$

20.  $x - 5y = 55$

## Two Types of Linear Equations

Slope-Intercept:

$$y = mx + b$$

slope

y-int

Standard Form:  $Ax + By = C$

- Makes it easy to find x and y-intercepts
- Certain word problems are easier to write equations in this form.

How to graph a linear equation?

*How many points do we  
need to make a line?*

## How to Graph an Equation in Slope-Intercept Form

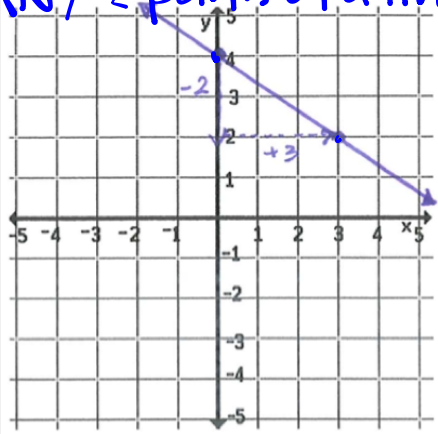
Slope is the same between ANY 2 points on a line

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

**Step 1:** Plot the y-intercept  
(in this case (0, 4))

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

**Step 2:** Use the slope to find the next point on the line from the y-intercept. Remember slope =  $\frac{\Delta y}{\Delta x}$  (in this case  $\frac{\Delta y}{\Delta x} = \frac{-2}{3}$  which means down 2 and 3 to the right.)

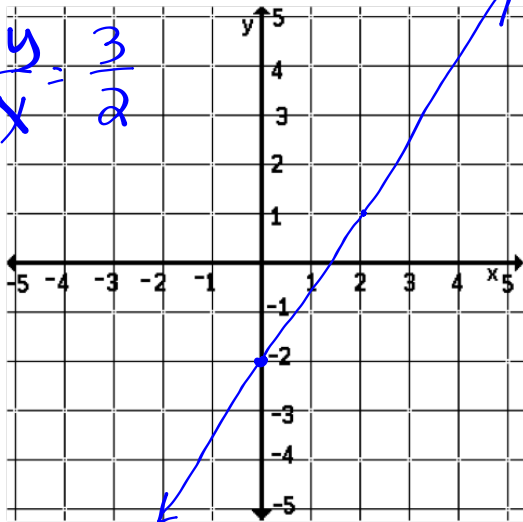


**Step 3:** Draw a line **through** both points with a ruler. Don't forget arrows!

Practice Graphing:

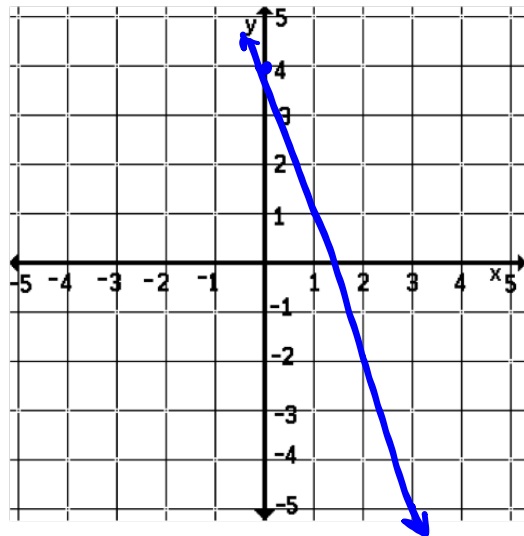
$y = \frac{3}{2}x - 2$  y-int

$$\frac{\Delta y}{\Delta x} = \frac{3}{2}$$



$y = -3x + 4$  y-int

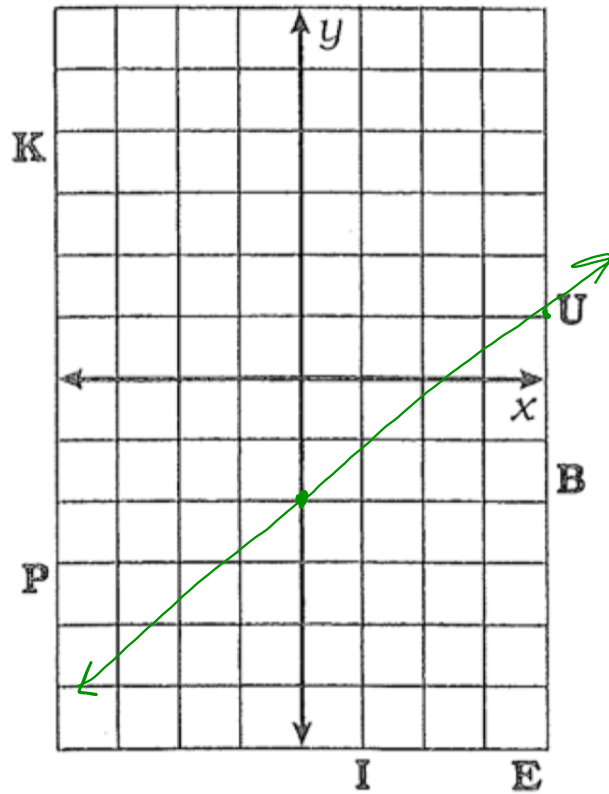
$$\frac{\Delta y}{\Delta x} = \frac{-3}{1}$$



①  $y = \frac{3}{4}x - 2$  ←

②  $y = -2x + 1$

③  $y = -\frac{5}{2}x - 4$





## How to Graph an Equation in Standard Form

Example:  $5x + 2y = -10$

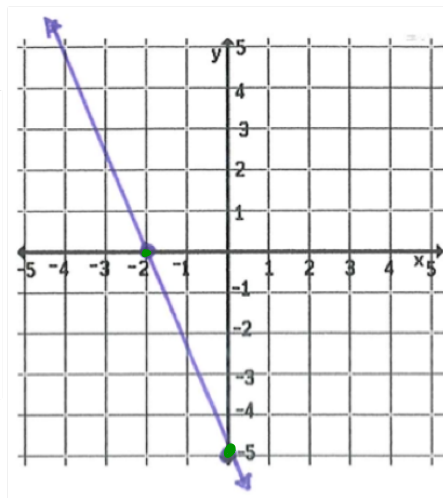
**Step 1:** Find the y-intercept by substituting zero in for x and solving for y.  
(in this case  $(0, -5)$ )

$$\begin{aligned}5x + 2y &= -10 \\5(0) + 2y &= -10 \\2y &= -10 \\y &= -5\end{aligned}$$

**Step 2:** Find the x-intercept by substituting zero in for y and solving for x.  
(in this case  $(-2, 0)$ )

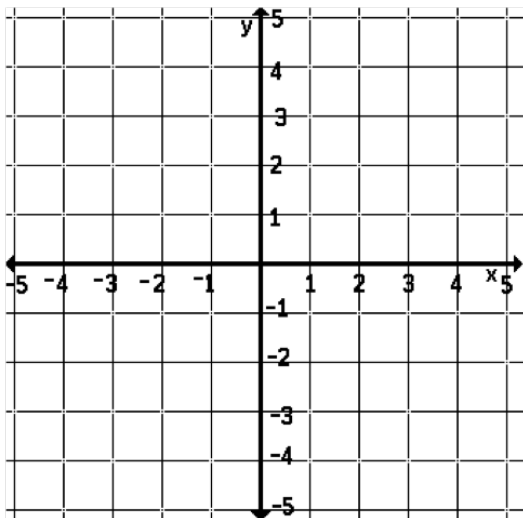
$$\begin{aligned}5x + 2y &= -10 \\5x + 2(0) &= -10 \\5x &= -10 \\x &= -2\end{aligned}$$

**Step 3:** Draw a line **through** both points with a ruler. Don't forget arrows!

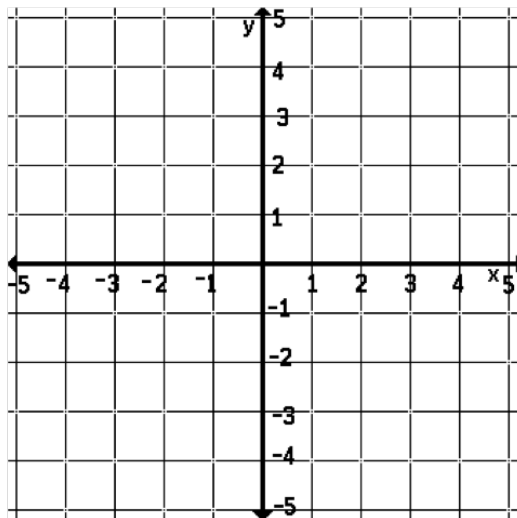


Practice Graphing:

$$3x - 2y = 6$$



$$3x + 6y = 12$$



## How to Graph an Equation in Slope-Intercept Form

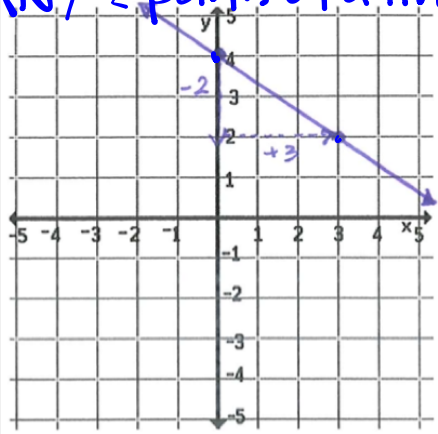
Slope is the same between ANY 2 points on a line

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

**Step 1:** Plot the y-intercept  
(in this case (0, 4))

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

**Step 2:** Use the slope to find the next point on the line from the y-intercept. Remember slope =  $\frac{\Delta y}{\Delta x}$  (in this case  $\frac{\Delta y}{\Delta x} = \frac{-2}{3}$  which means down 2 and 3 to the right.)

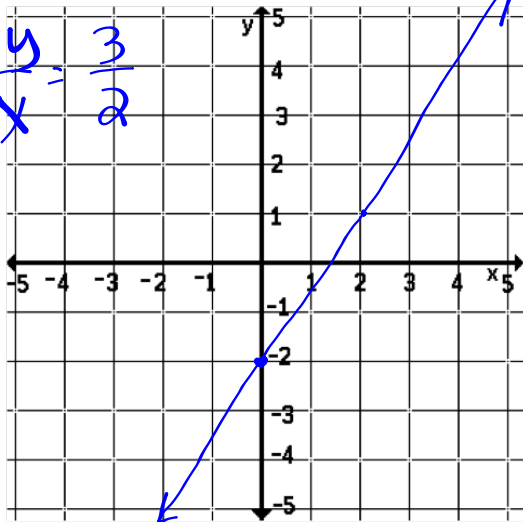


**Step 3:** Draw a line **through** both points with a ruler. Don't forget arrows!

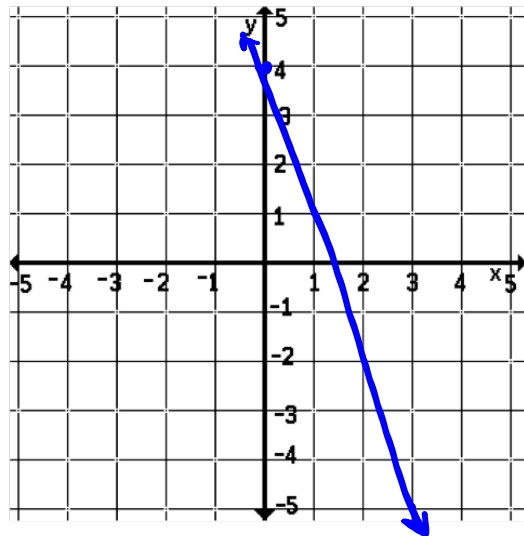
Practice Graphing:

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

$$\frac{\Delta y}{\Delta x} = \frac{3}{2}$$



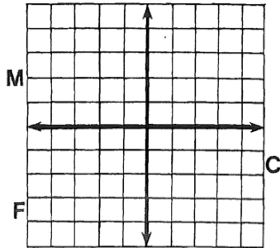
$y = -3x + 4$  y-int



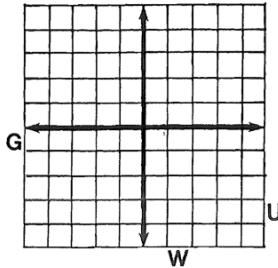
## Why Did Miss Muffet Need A Road Map?

Graph any equation below. (Let each space along the axes represent 1 unit.) The graph, if extended, will cross a letter. Look for this letter in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the letters that have NOT been crossed out in the rectangle at the bottom of the page.

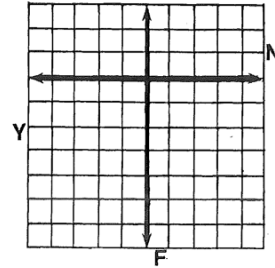
①  $2x + 3y = 6$



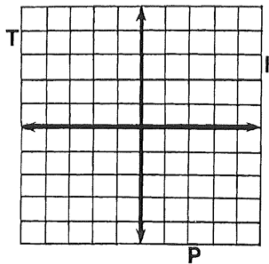
②  $-x + 2y = 4$



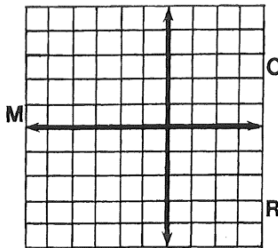
③  $3x + y = -6$



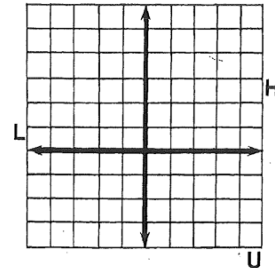
④  $4x - 3y = 12$



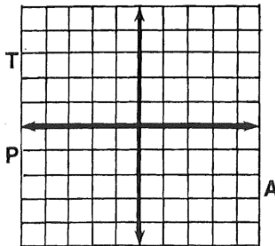
⑤  $-3x - 5y = 15$



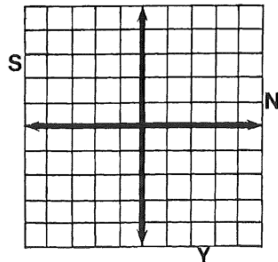
⑥  $2x + y = 5$



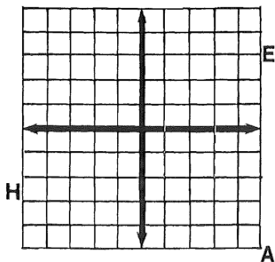
⑦  $x - 2y = -3$



⑧  $-3x + 5y = -10$



⑨  $x + y = 0$



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ANSWER:

#7 we can easily find x-int

$$\begin{aligned}
 x - 2y &= -3 \\
 -2y &= -x - 3 \\
 -\frac{2y}{2} &= \frac{-x - 3}{2} \\
 y &= \frac{x}{2} + \frac{3}{2} \\
 \text{y-int: } &(0, \frac{3}{2}) \\
 x - 2(0) &= -3 \\
 x &= -3 \\
 \text{x-int: } &(-3, 0)
 \end{aligned}$$

# #'s 1-9

## What Happened to the Guy Who Fell Into an Upholstery Machine?

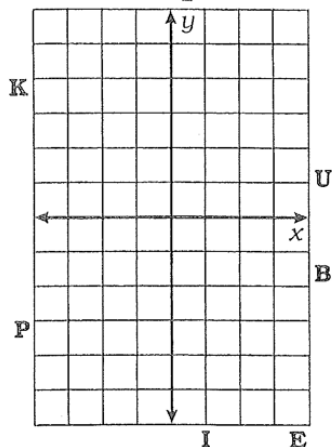


Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter. Write this letter in the box containing the exercise number.

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

2  $y = -2x + 1$

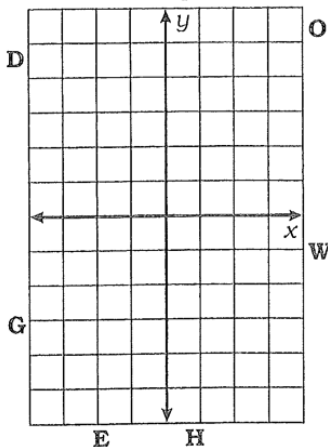
3  $y = -\frac{5}{2}x - 4$



4  $y = \frac{1}{3}x + 4$

5  $y = 3x - 1$

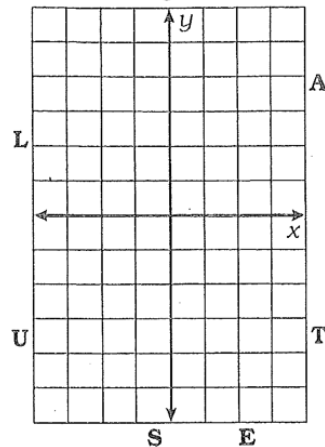
6  $y = -\frac{7}{4}x - 5$



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

8  $y = -4x + 3$

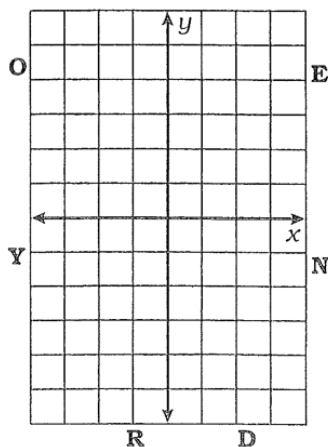
9  $y = \frac{8}{3}x - 5$



10  $y = x + 3$

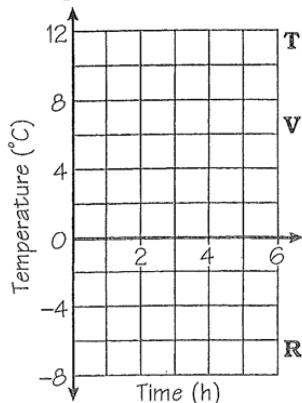
11  $y = -x - 4$

12  $y = x$



13 The temperature is  $-6^{\circ}\text{C}$  and rising at a rate of  $2^{\circ}$  per hour.

14 The temperature is  $12^{\circ}\text{C}$  and dropping at a rate of  $3^{\circ}$  per hour.

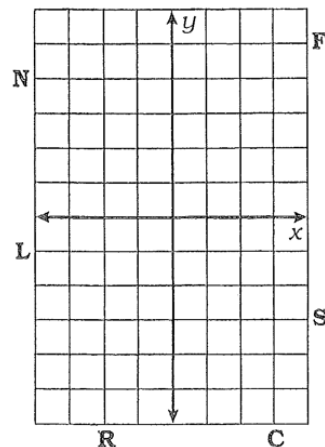


15  $y = 5$

17  $y = -1$

16  $x = -2$

18  $x = 3$



6 12 3 9 15 1 17 7 10 14 8 18 4 13 2 16 5 11

# Homework

Finish classwork