Warmup 11/

Created by Nate Lischwe

$$\left|\left(5+\left(8-\left(6+\left(5-(2+1)\right)\right)\right)\right|^2+\left|(\sqrt{3})^2\right|$$

1. **Find the solution:**

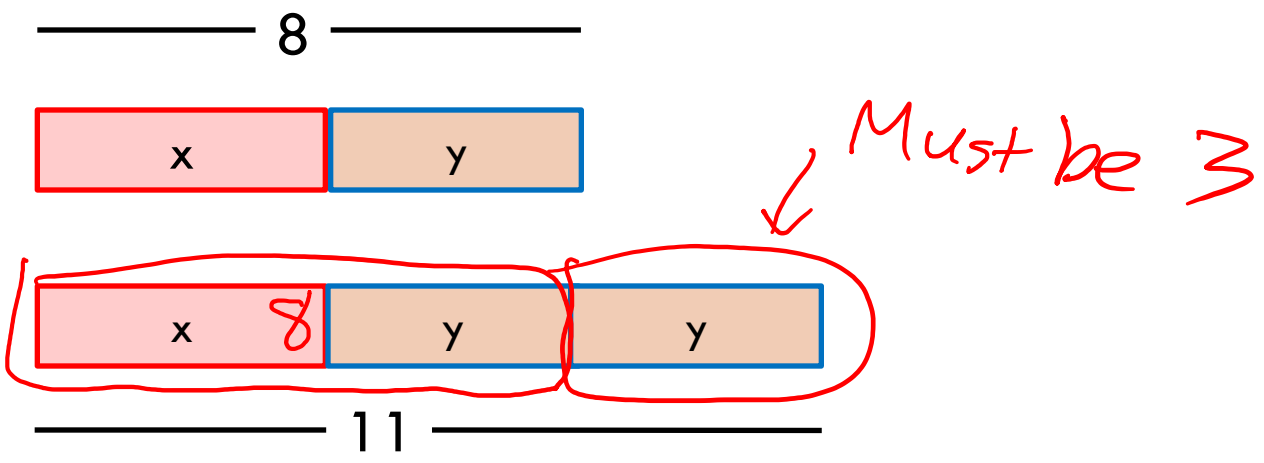
$$\begin{cases} x+y=8 \\ x+2y=11 \end{cases} \quad (5,3)$$

2. What is the slope of the line with the equation **y = 10 – x?** -1

3. **Early finishers: Today is the 28th. Verify that my brother's date problem is correct.**

Using a bar diagram:

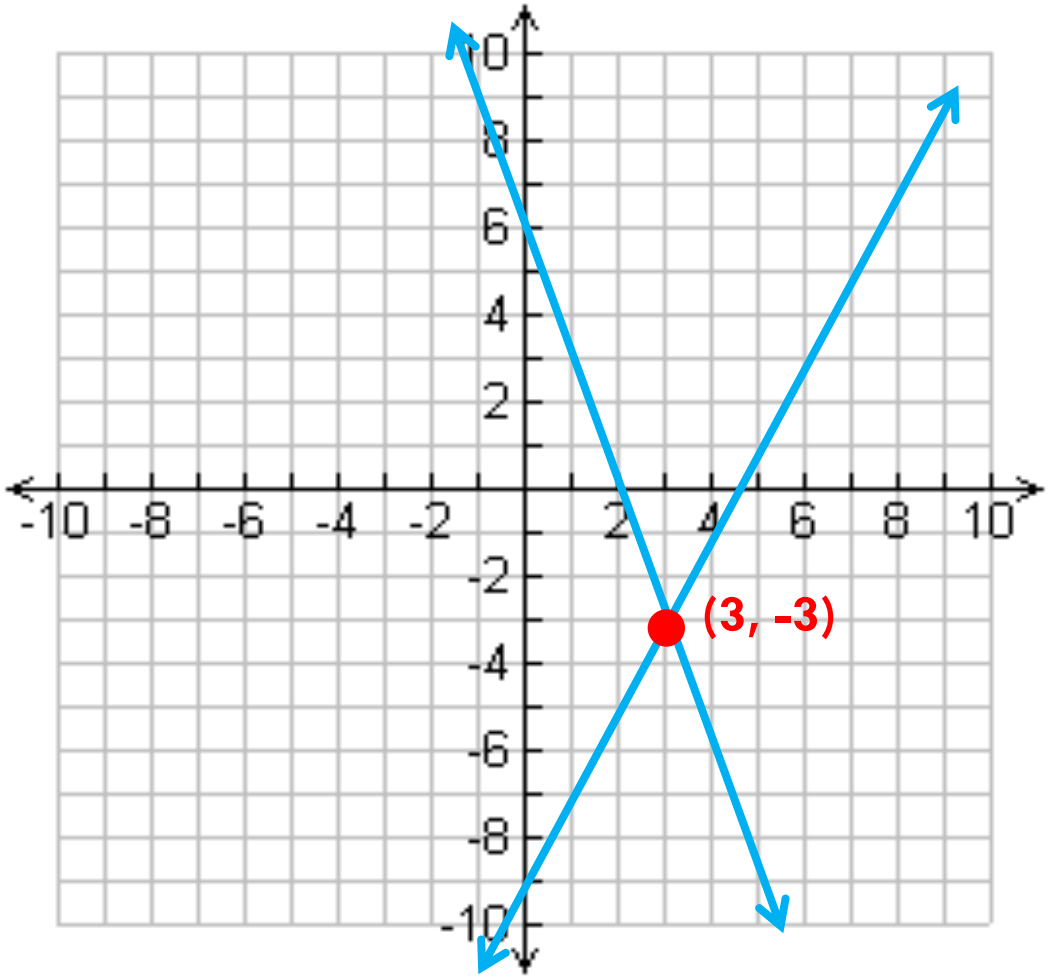
- $\begin{cases} x + y = 8 \\ x + 2y = 11 \end{cases}$



Go over HW

Example 2

$$\begin{cases} y = 2x - 9 \\ y = -3x + 6 \end{cases}$$



Check the solution:

- $\begin{cases} y = 2x - 9 \\ y = -3x + 6 \end{cases}$

$-3 = 2(3) - 9$ ✓

$-3 = 6 - 9$

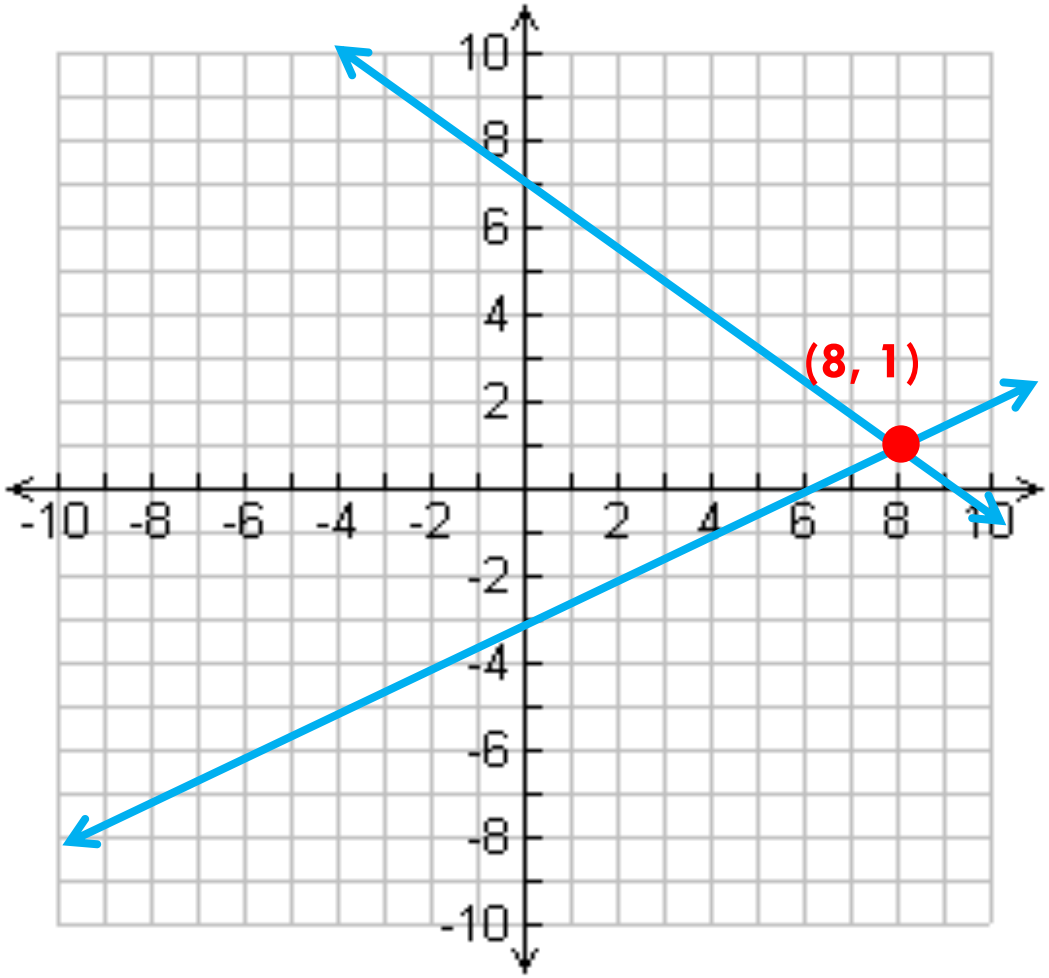
$-3 = -3(3) + 6$

$-3 = -9 + 6$

- **The solution was (3, -3).**

Example 3

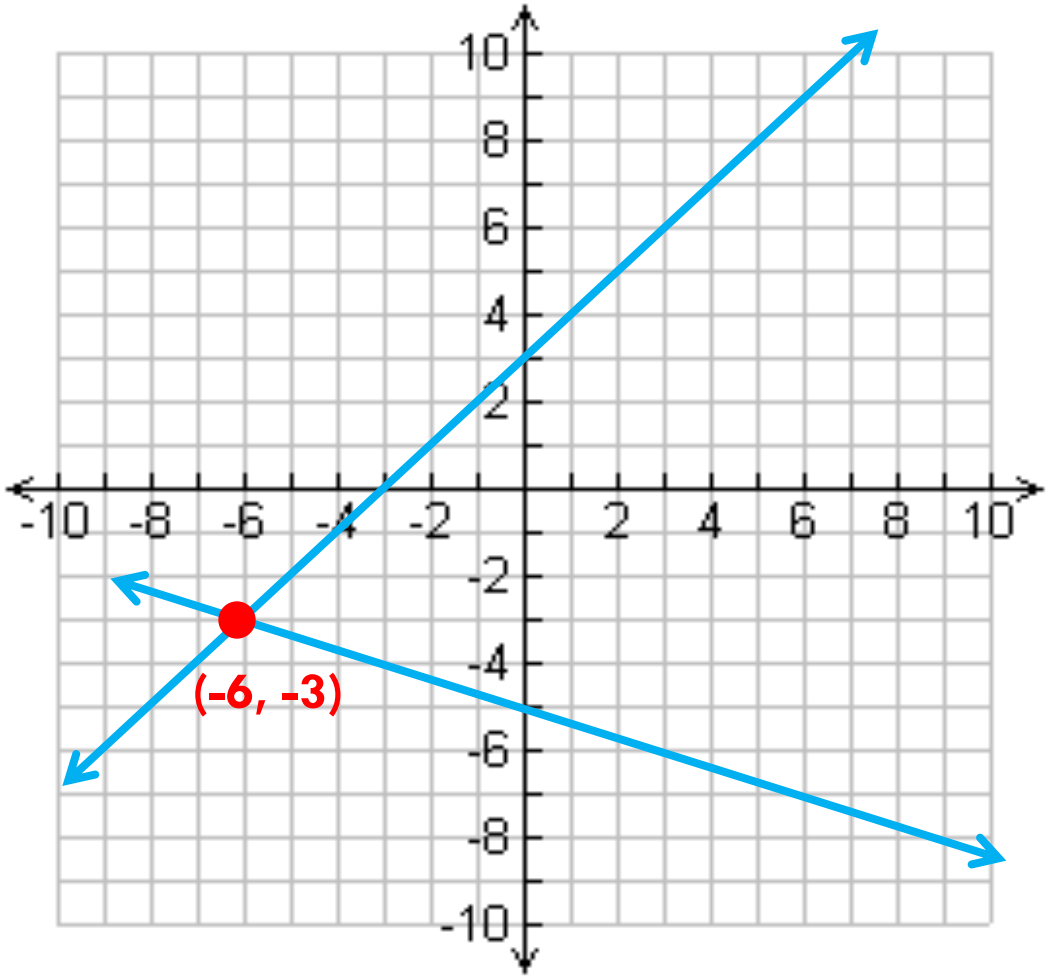
$$\begin{cases} y = -\frac{3}{4}x + 7 \\ y = \frac{1}{2}x - 3 \end{cases}$$



Early finishers: Check your solution!!!

Example 4

$$\begin{cases} y = x + 3 \\ y = -\frac{1}{3}x - 5 \end{cases}$$



Early finishers: Check your solution!!!

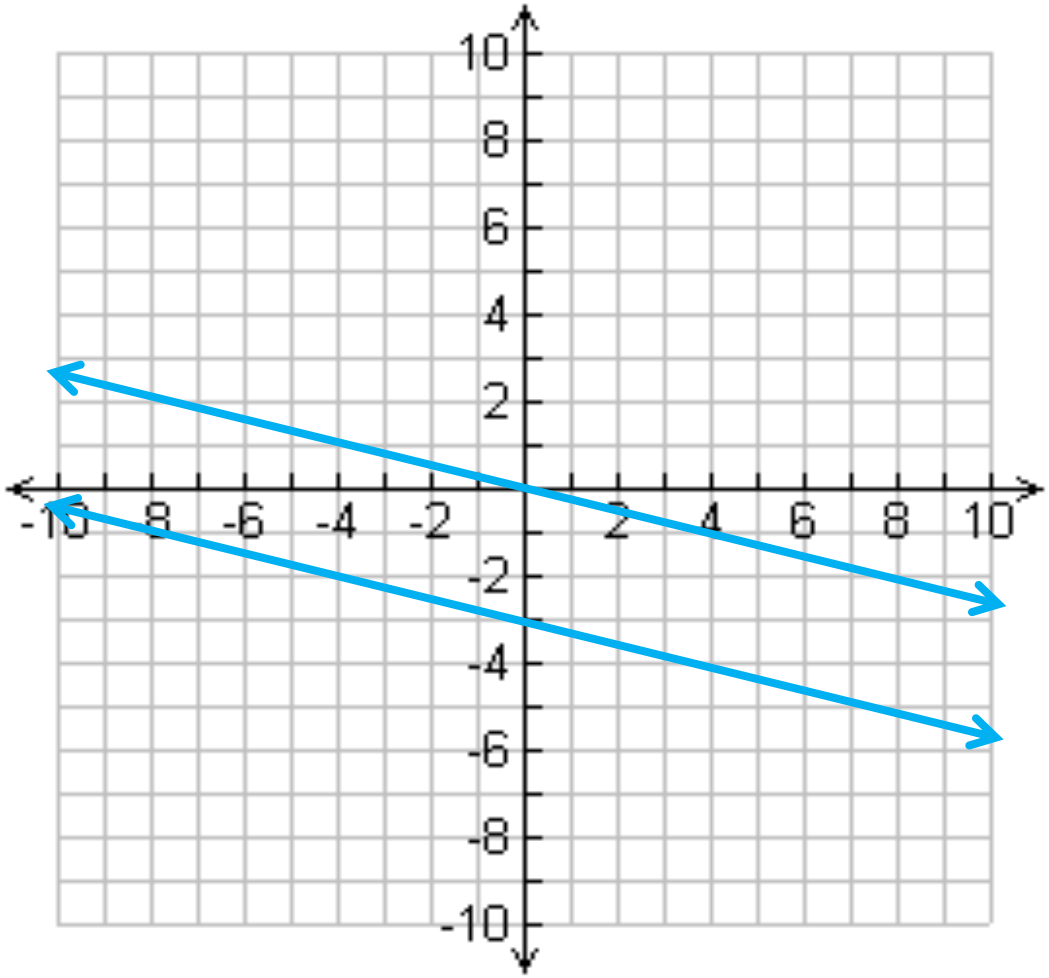
Graphing: Advice

- You should extend your line to **both sides** of the graph – your solution might be in the negatives!

Example 5

NO SOLUTION!

$$\begin{cases} y = -\frac{1}{4}x \\ y = -\frac{1}{4}x - 3 \end{cases}$$

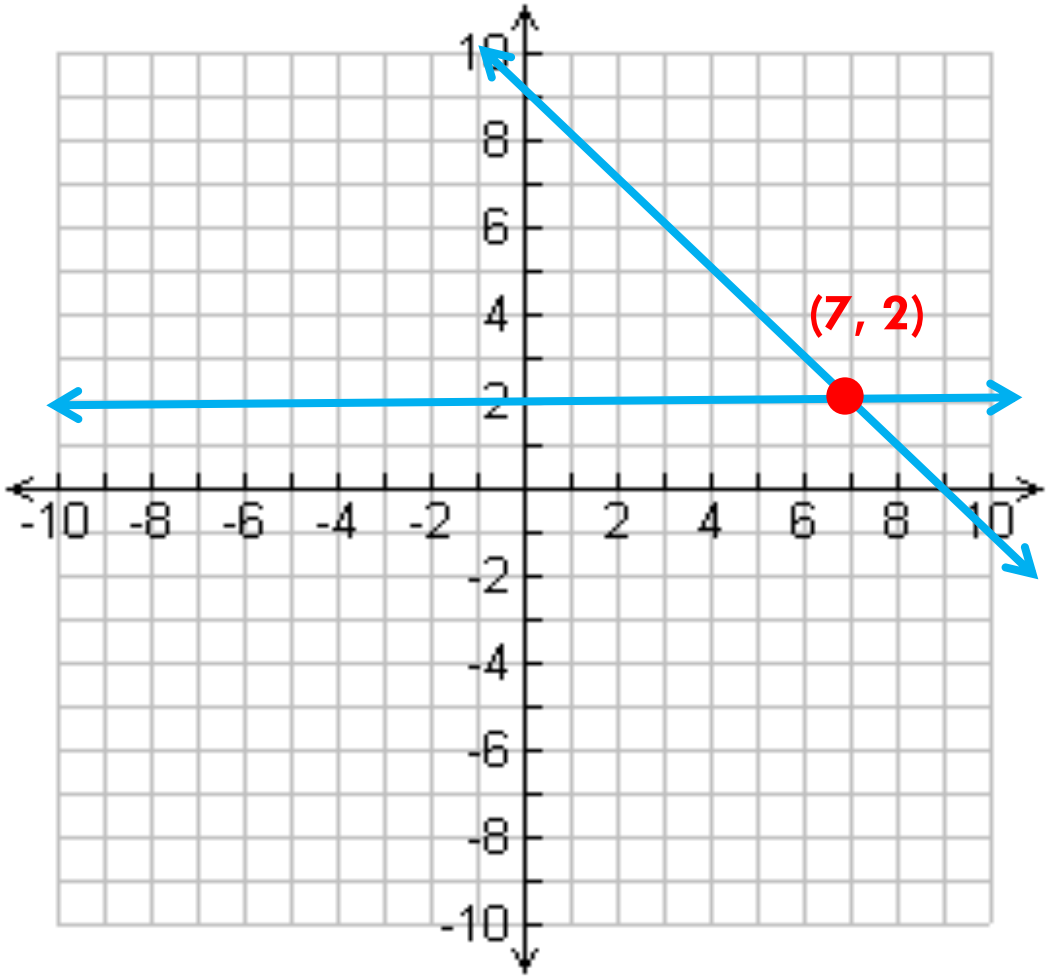


Early finishers: Check your solution!!!

Example 6

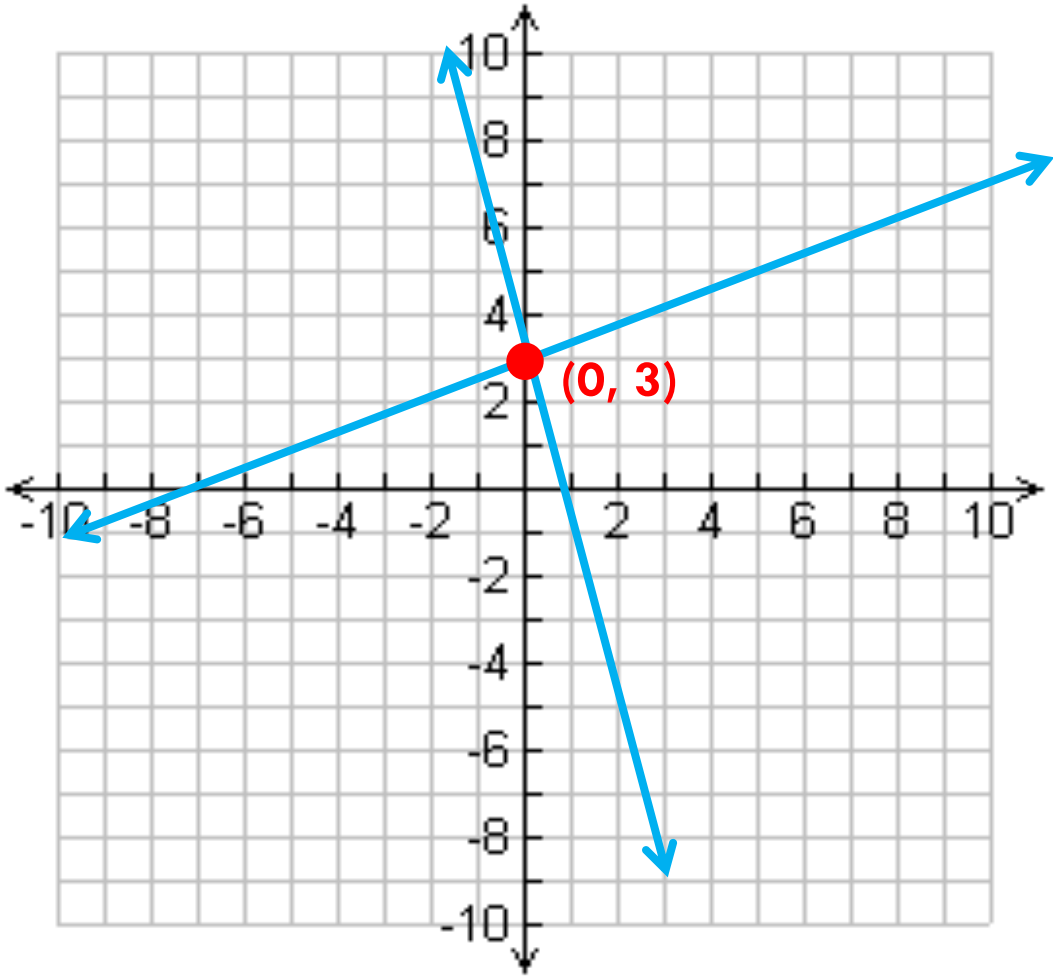
$$\begin{cases} y = -x + 9 \\ y = 2 \end{cases}$$

y = 2 → y = 0x + 2



Solve by Graphing

$$\begin{cases} y = \frac{2}{5}x + 3 \\ y = -4x + 3 \end{cases}$$

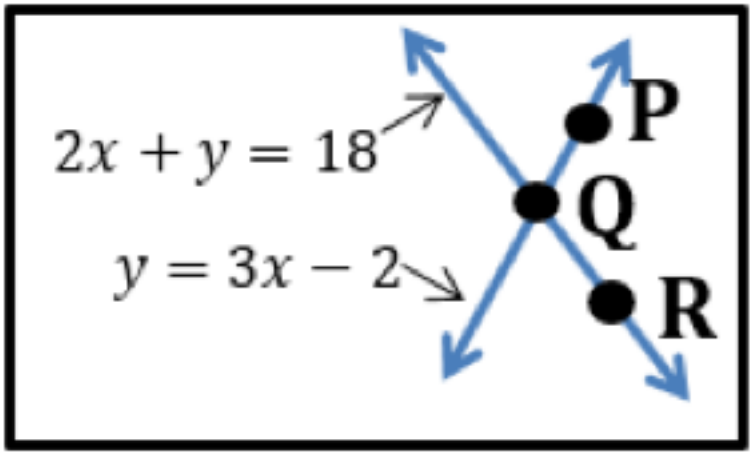


Early finishers: Check your solution!!!

Example 7:

- The graphs of two equations are shown below, without the grid. Out of the four possible points below, determine the identities of points P, Q, and R. (Look at the ESSENTIAL IDEA again!)

- (9, 0) $2(9)+0=18$ ✓ $0=3(9)-2$ ✗ R
- (8, 4) $2(8)+4=18$ ✗ $4=3(8)-2$ ✗
- (4, 10) $2(4)+10=18$ ✓ $10=3(4)-2$ ✓ Q
- (6, 16) $2(6)+16=18$ ✗ $16=3(6)-2$ ✓ P



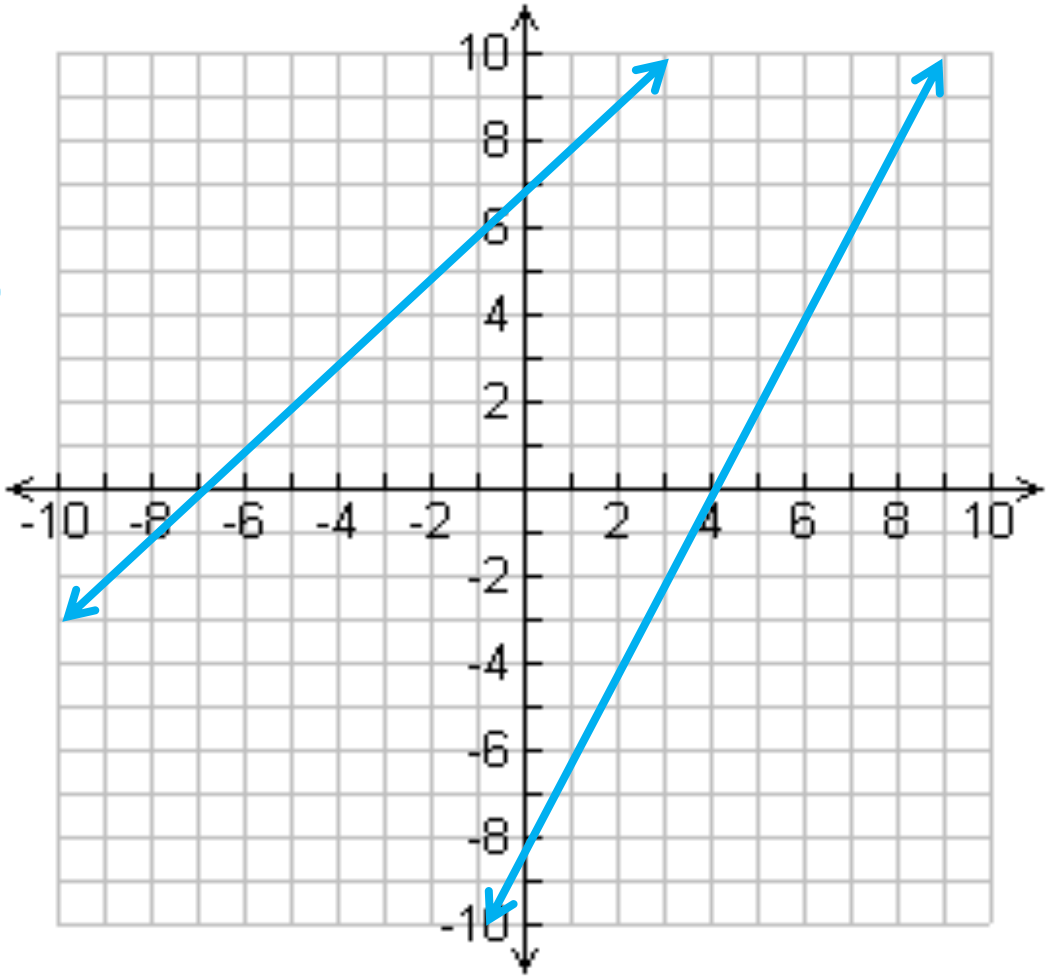
Solve by Graphing

$$\begin{cases} y = x + 7 \\ y = 2x - 8 \end{cases}$$

Does this mean there is NO solution???

No…it just means our graph isn't big enough

Soon we will learn OTHER strategies you can use when graphing doesn't work.

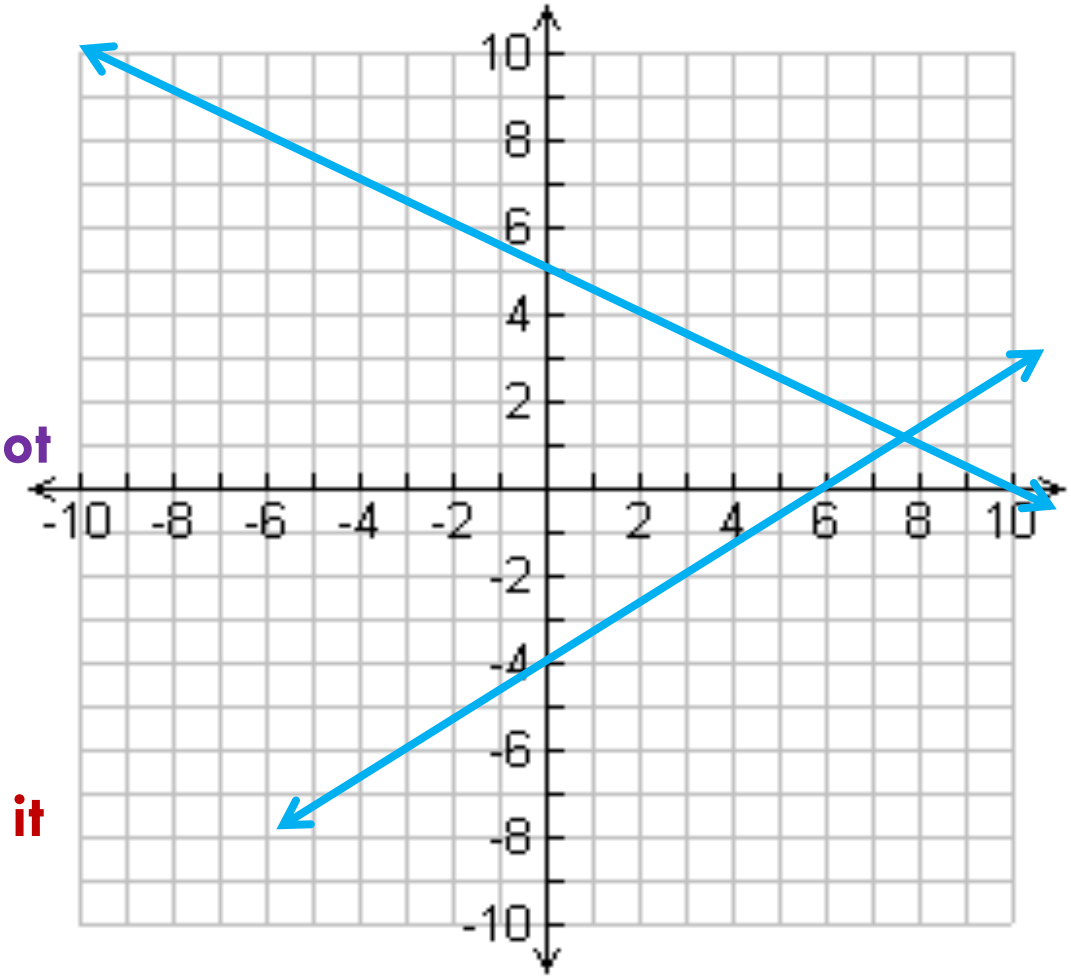


Another situation when graphing doesn't work…

$$\begin{cases} y = \frac{2}{3}x - 4 \\ y = -\frac{1}{2}x + 5 \end{cases}$$

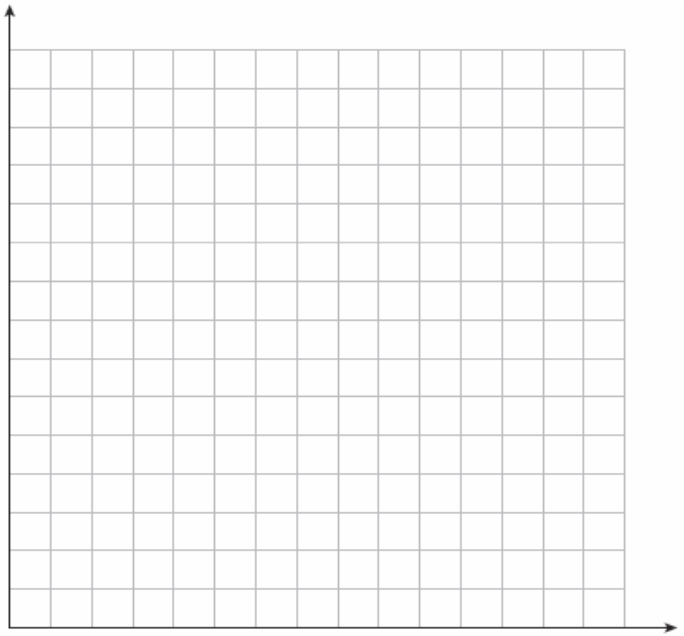
If your solution ends up in the middle of a box, you should not just use the nearest numbers. This would not be an exact answer!

In this case, you should solve it algebraically.



Story Problem: Solve by Graphing

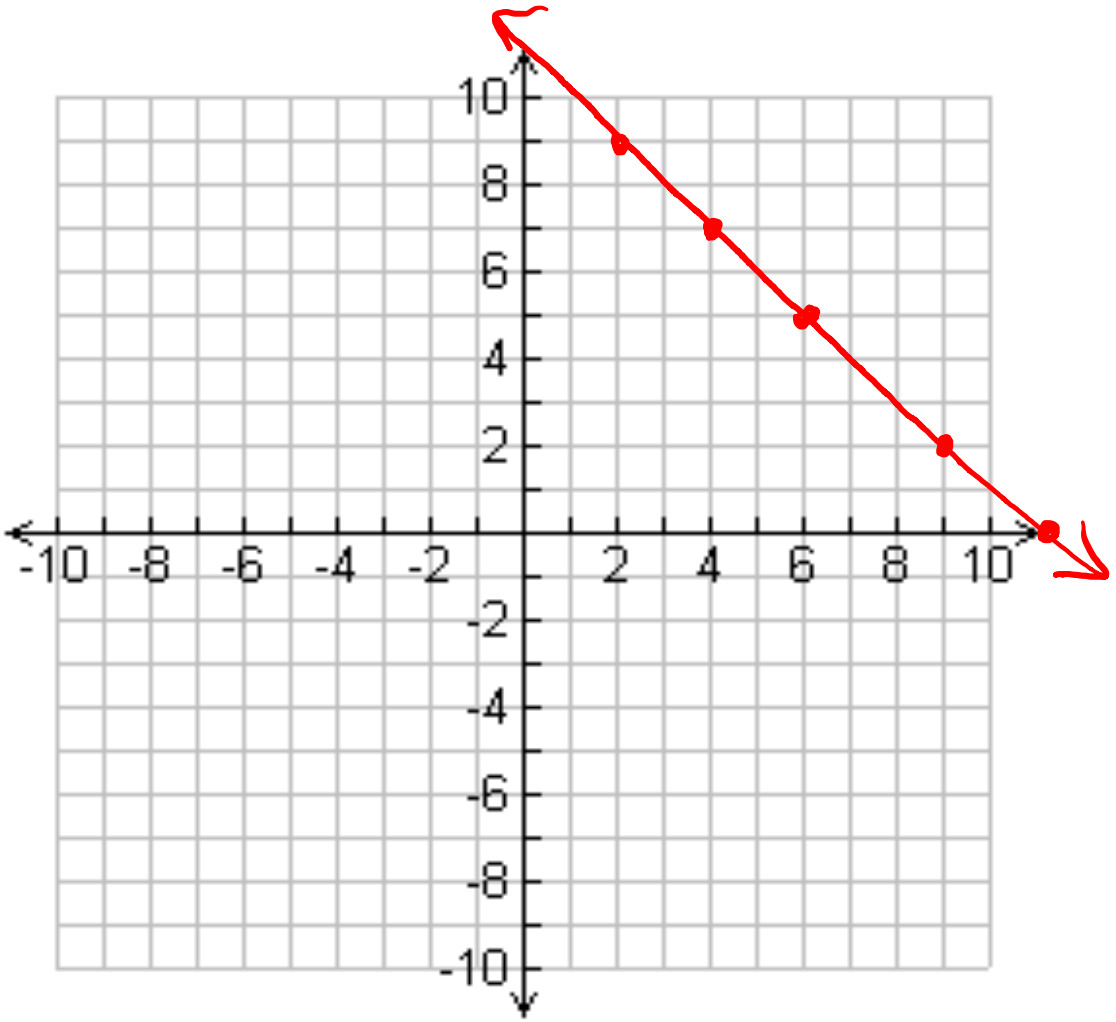
- Bowl-o-Rama charges $3 per game plus $2 for shoe rental, and Bowling Pinz charges $2 per game plus $5 for shoe rental. For how many games will the cost to bowl be the same at both places? What is the cost?



How would you graph this?

$x + y = 11$

x	y
6	5
4	7
11	0
2	9
9	2



Standard Form:

$$Ax + By = C$$

(Basically, standard form is when x and y are on the same side)

Graphing Standard Form

- Graph standard form by figuring out **(x, y)** pairs that make the equation true

$$4x + 2y = 20$$

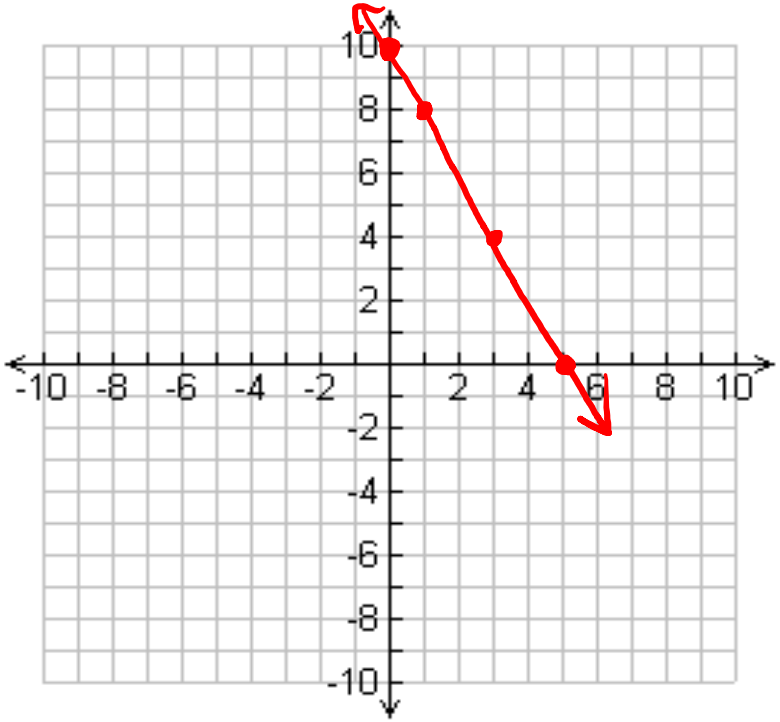
If x = 3, what is y?

If x = 1, what is y?

If x = 0, what is y?

If y = 0, what is x?

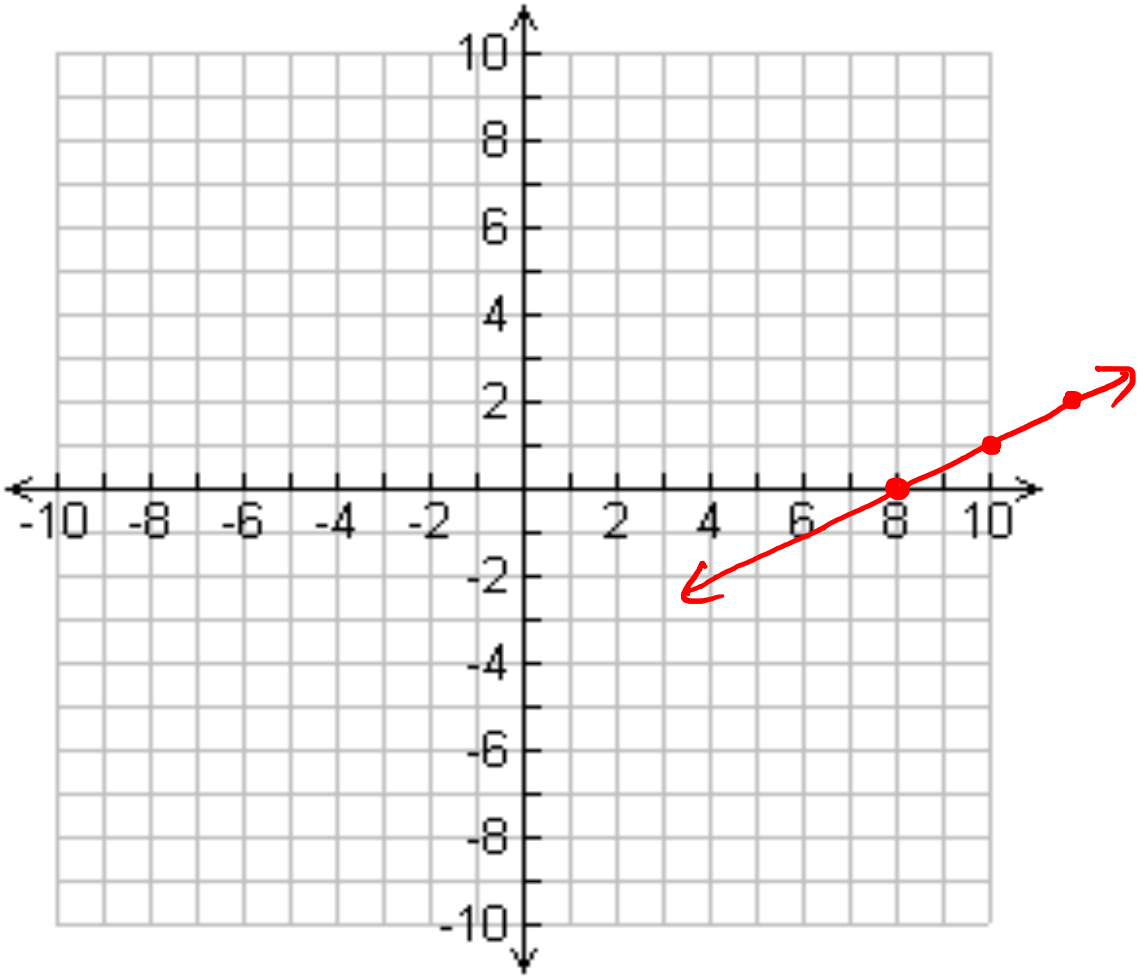
x	y
3	4
1	8
0	10
5	0



How would you graph this?

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

x	y
10	1
12	2
8	0



Another strategy…

- If an equation is not in slope-intercept form, you can PUT it in slope intercept form:
- (Get y by itself!)

Not like terms – do not combine!

- $y - 3x = 8$

$+3x \quad +3x$

$y = 8 + 3x$ or

$y = 3x + 8$

Getting y by itself

$x + y = 11$

$-x \qquad -x$

$y = 11 - x$

$4x + 2y = 20$

$-4x \qquad -4x$

$\frac{2y}{2} = \frac{20}{2} - \frac{4x}{2}$

$y = 10 - 2x$

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

$-4 \qquad -4$

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

- To graph an equation that is NOT in slope-intercept form:
  - **Make a table and figure out numbers that work in the equation (at least 2 points)**

OR

  - **Get y by itself, then graph using slope-intercept rules**

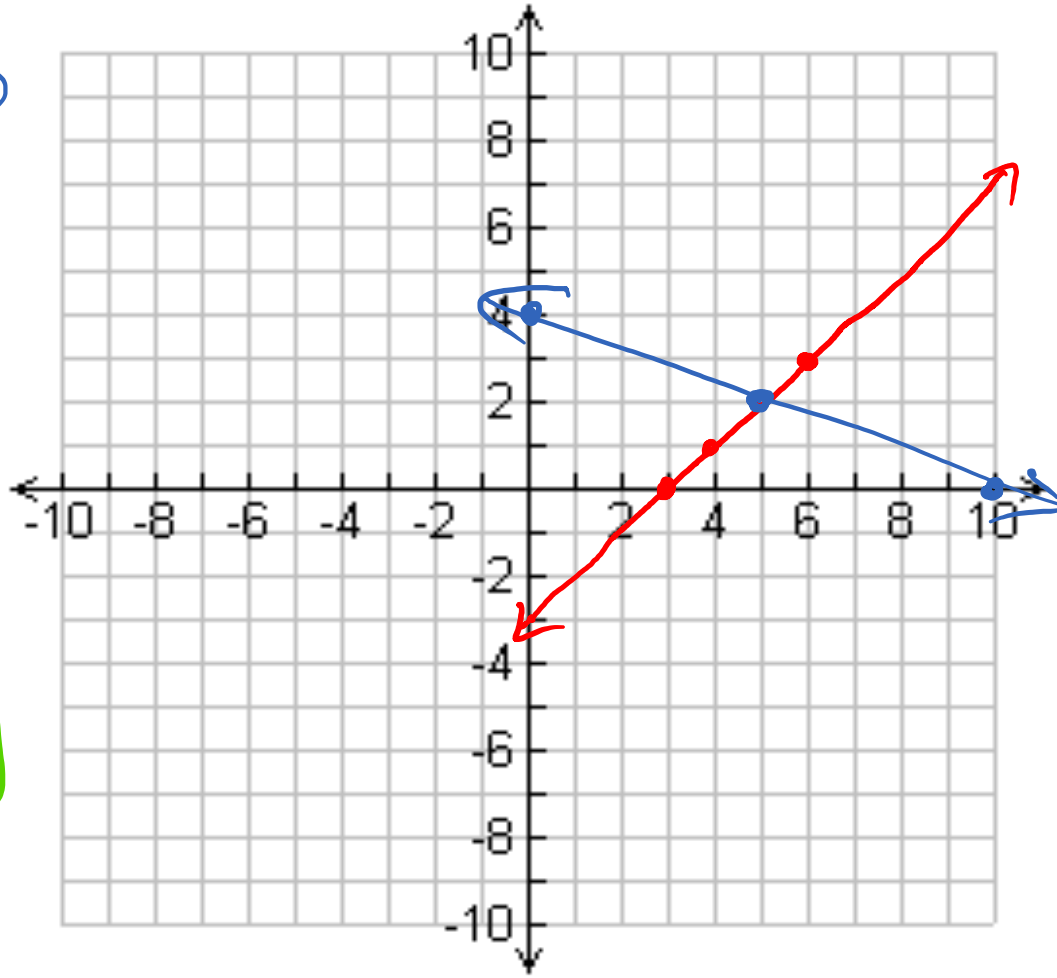
Example 8

$$\begin{cases} x - y = 3 \\ 2x + 5y = 20 \end{cases}$$

x	y
3	0
4	1
5	2
6	3

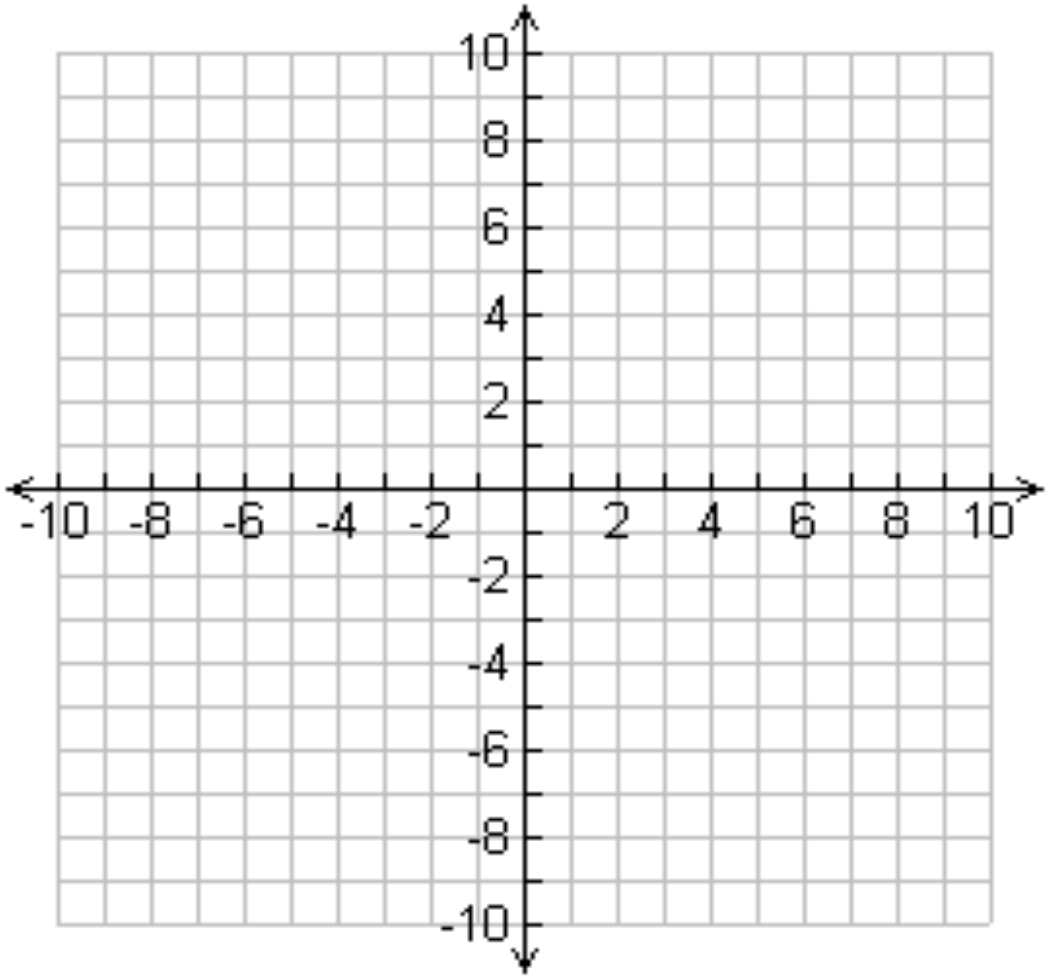
x	y
0	4
10	0
5	2

(5, 2)



Example 9

$$\begin{cases} y - 3x = 8 \\ \frac{1}{4}x = y + 3 \end{cases}$$

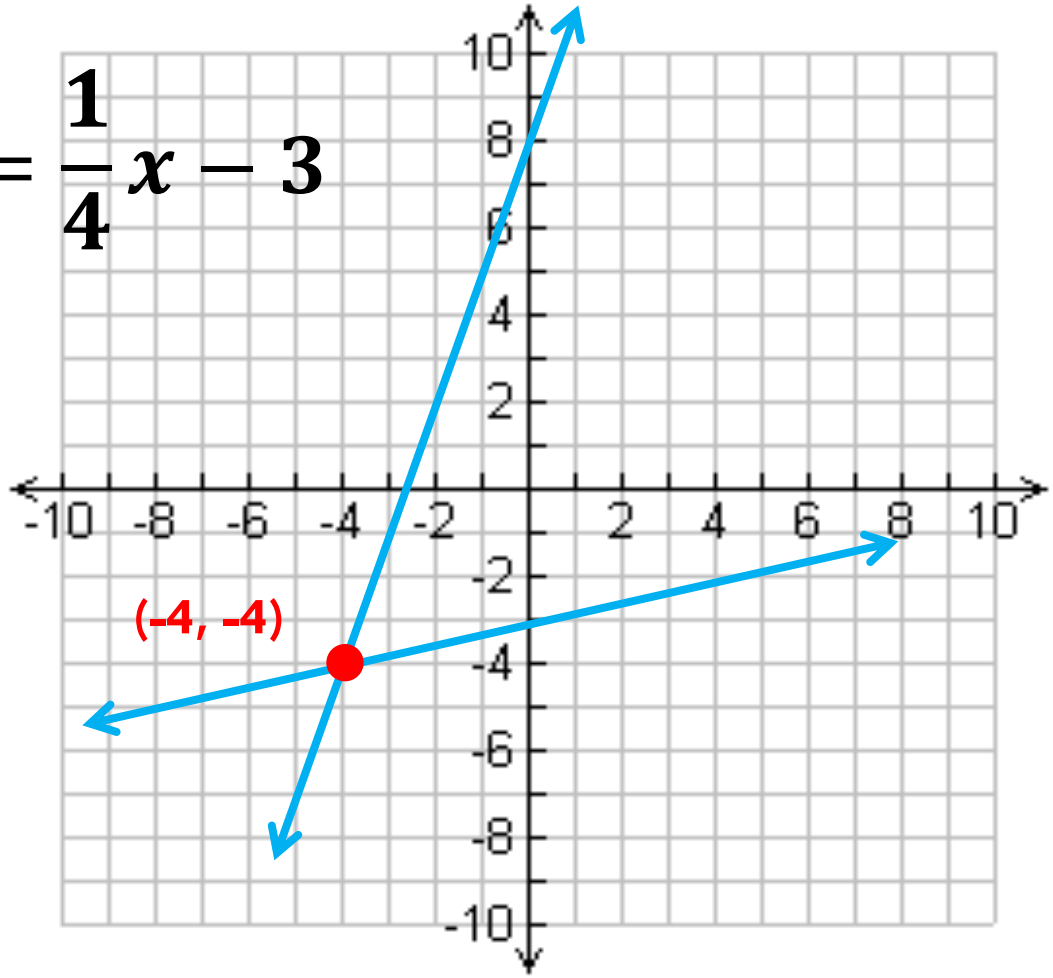


What about this?

$$\begin{cases} y - 3x = 8 \\ \frac{1}{4}x = y + 3 \end{cases}$$

$$y = 3x + 8$$

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



Graphing Standard Form

- Graph standard form by figuring out **(x, y)** pairs that make the equation true

$$4x + 2y = 20$$

STEP 1: Plug in 0 for x **(0, ?)**

$4(0) + 2y = 20$

$y = 10$ **(0, 10)**

STEP 2: Plug in 0 for y **(?, 0)**

$4x + 2(0) = 20$

$x = 5$ **(5, 0)**

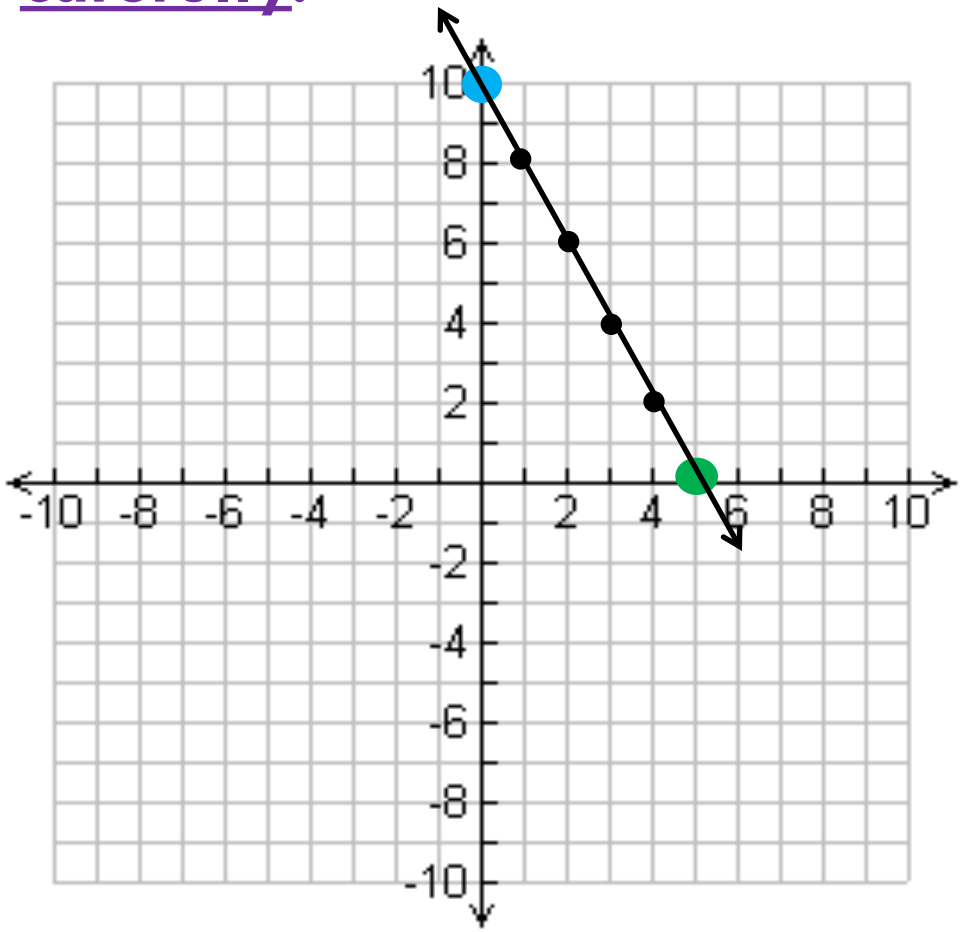
$4x + 2y = 20$

STEP 3: Graph the 2 points and connect them carefully!

(0, 10) **(5, 0)**

You can use the slope to get a more precise line. Between the points is down 10, right 5.

$$\frac{-10}{5} \rightarrow \frac{-2}{1}$$



Classwork/Homework

- **Solving Systems by Graphing Worksheet**
- **BE PRECISE**
- **LOOK OUT FOR POSITIVE/NEGATIVE SLOPES!**