

# Warmup 12/(# of T's in "Tennessee Titans")

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For each problem, try to figure out the (x, y) pair that would work in each equation. You can use mental math, or make a table if that helps you.

1)  $\begin{cases} x + y = 12 \\ x - y = 2 \end{cases}$  (7, 5)

2)  $\begin{cases} x + y = 25 \\ x \div y = 4 \end{cases}$  (20, 5)

3)  $\begin{cases} y = 2x + 8 \\ y = 4x + 2 \end{cases}$  (3, 14)

Extra Practice & Corrections  
sheets are printed!!!

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## Solving Systems of Equations by Graphing

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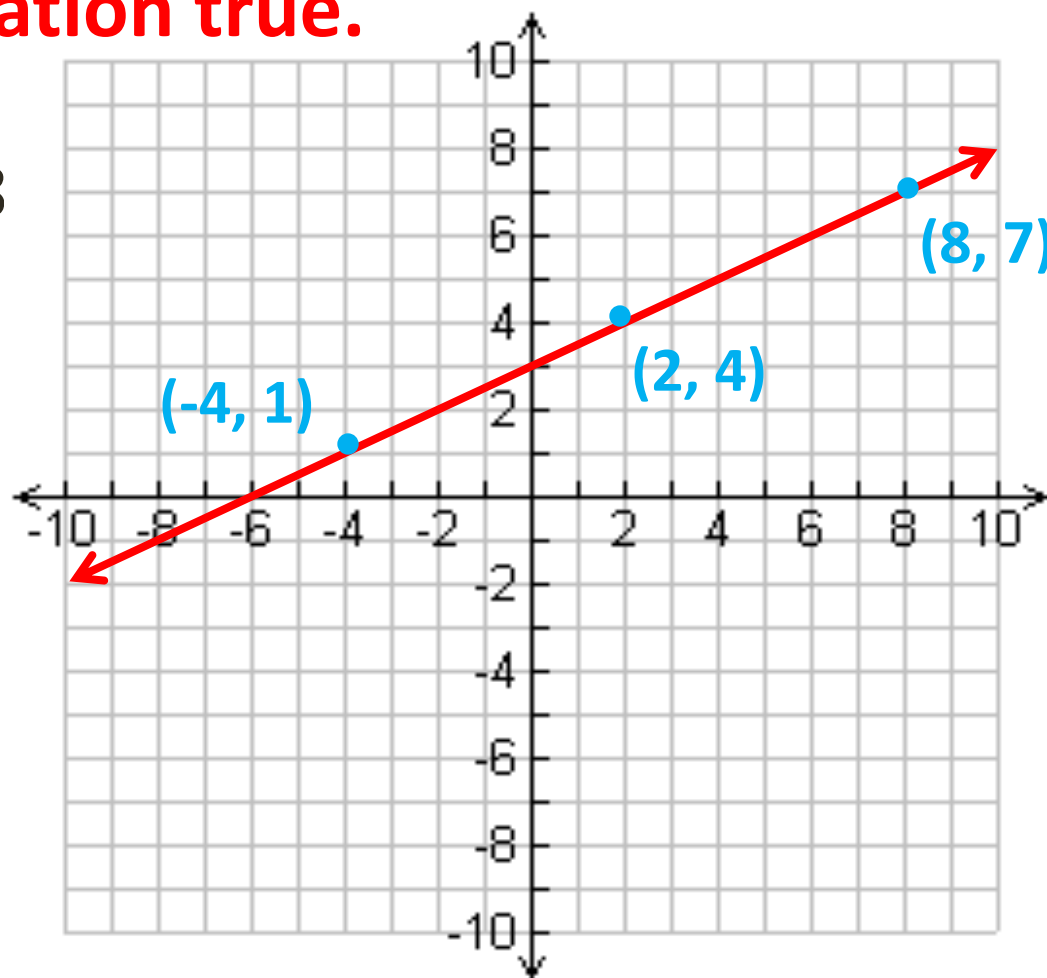
### Objective:

- Use graphing to solve systems of equations
- Learn how to graph equations that are NOT in slope-intercept form

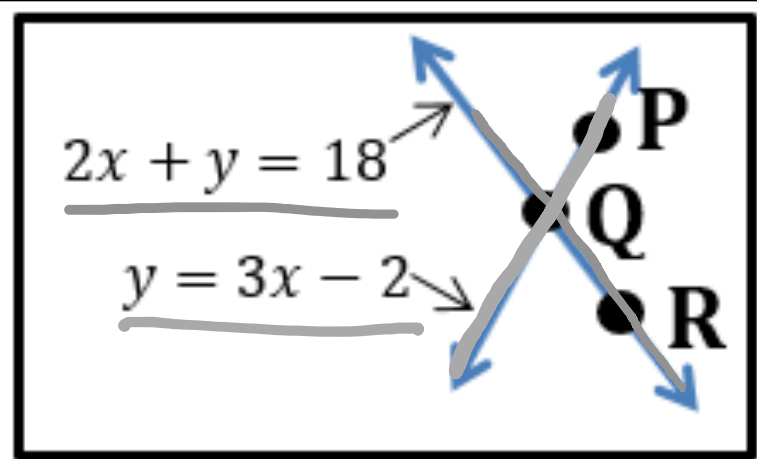
# VERY IMPORTANT to understand:

If an  $(x, y)$  point is on the graph of an equation, that  $x$  and  $y$  will also make the equation true.

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



# 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)

$$2(9) + 0 = 18$$
$$18 = 18 \checkmark$$

$$0 = 3(9) - 2$$
$$0 = 25 \times$$

**R**

(8, 4)

$$2(8) + 4 = 18$$
$$20 = 18 \times$$

$$4 = 3(8) - 2$$
$$4 = 22 \times$$

**None**

(4, 10)

$$2(4) + 10 = 18$$
$$18 = 18 \checkmark$$

$$10 = 3(4) - 2$$
$$10 = 10 \checkmark$$

**Q**

(6, 16)

$$2(6) + 16 = 18$$
$$28 = 18 \times$$

$$16 = 3(6) - 2$$
$$16 = 16 \checkmark$$

**P**

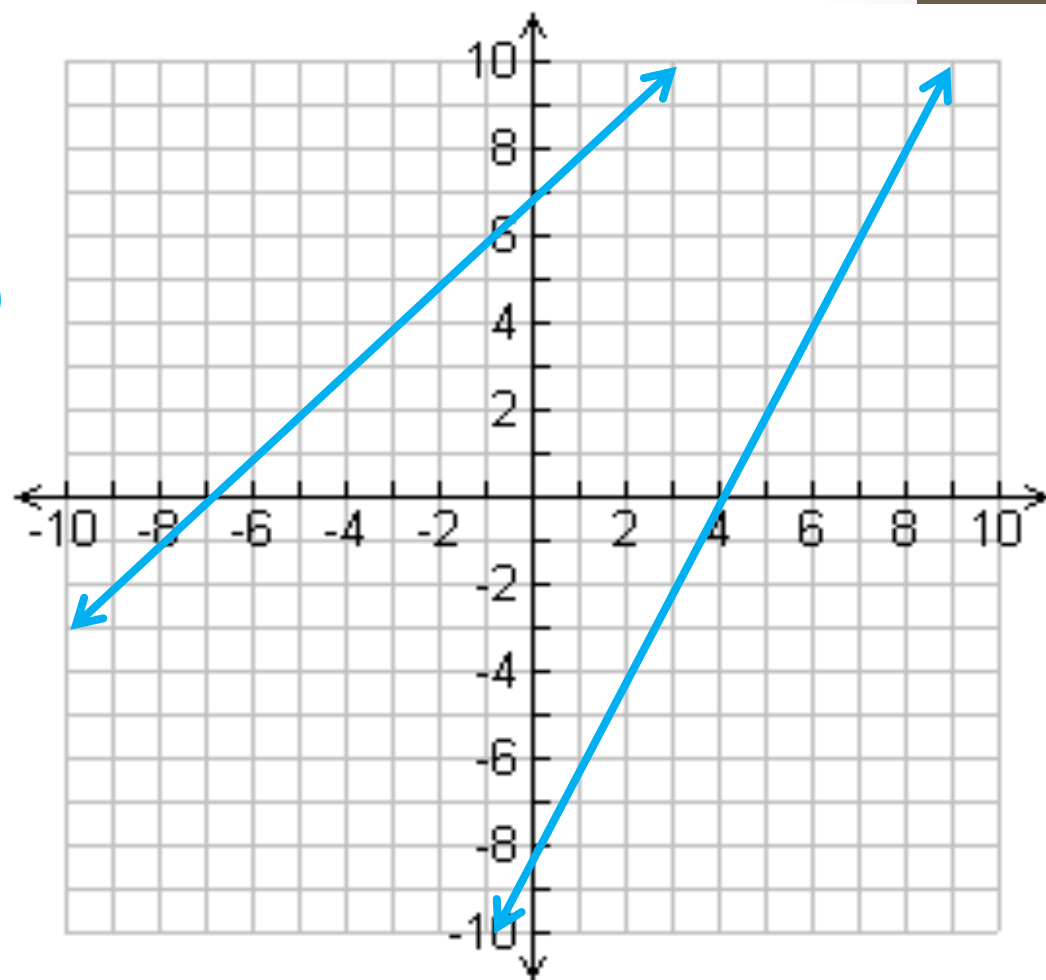
# Solve by Graphing

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

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.

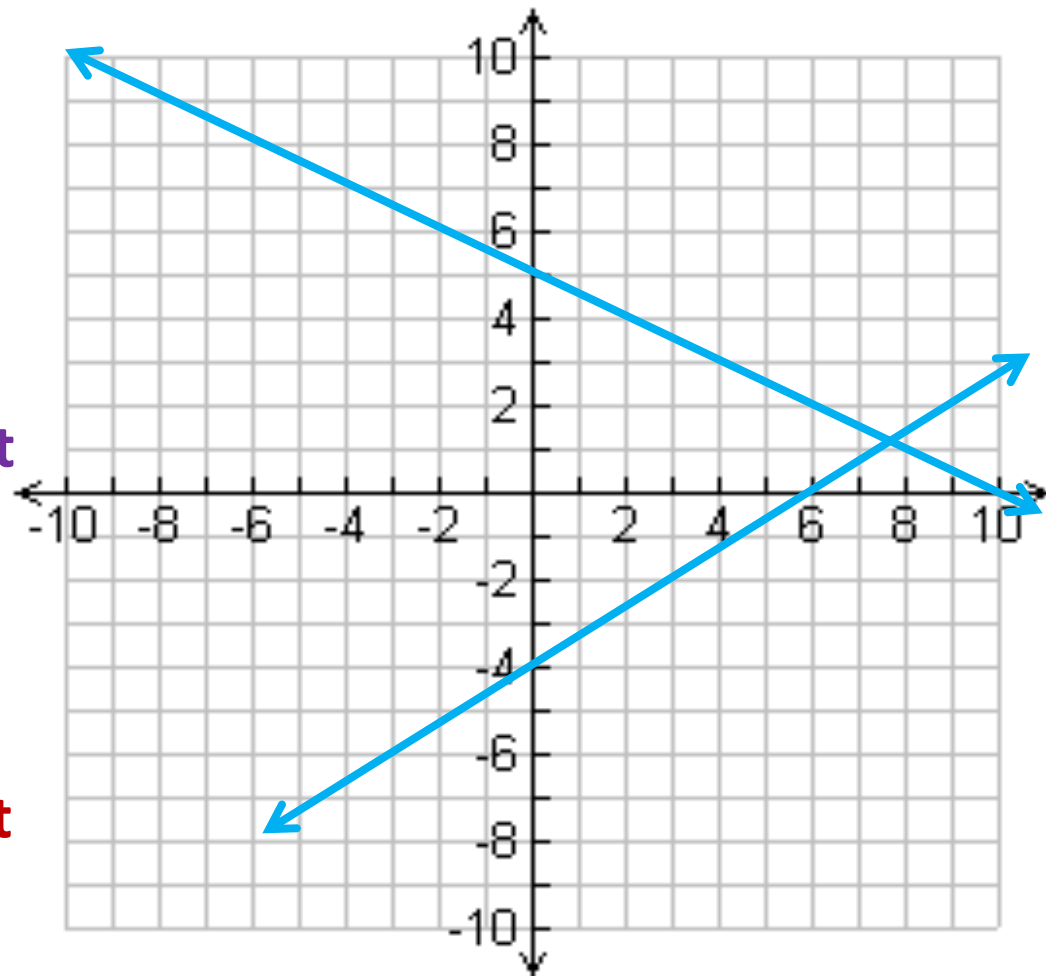


# Another situation when graphing doesn't work...

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

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.

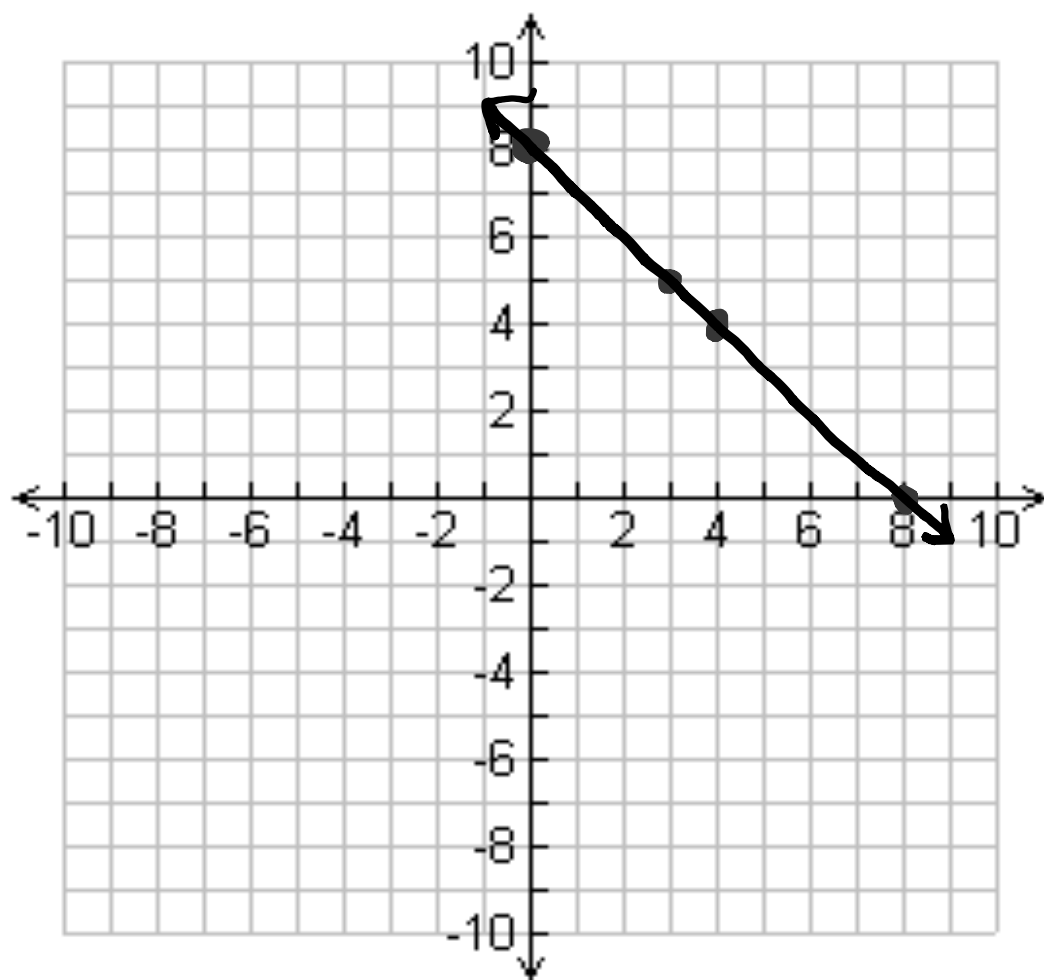




# How would you graph this?

$$x + y = 8$$

x	y
8	0
0	8
4	4
3	5
etc.	



## 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  $y$ ?

4

If  $x = 1$ , what is  $y$ ?

8

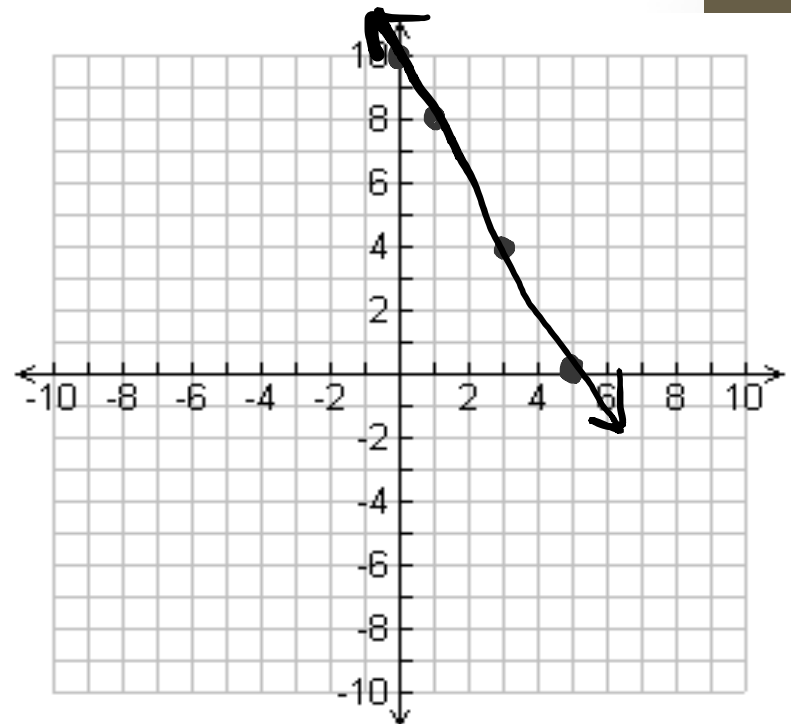
If  $x = 0$ , what is  $y$ ?

10

If  $y = 0$ , what is  $x$ ?

5

x	y
3	4
1	8
0	10
5	0

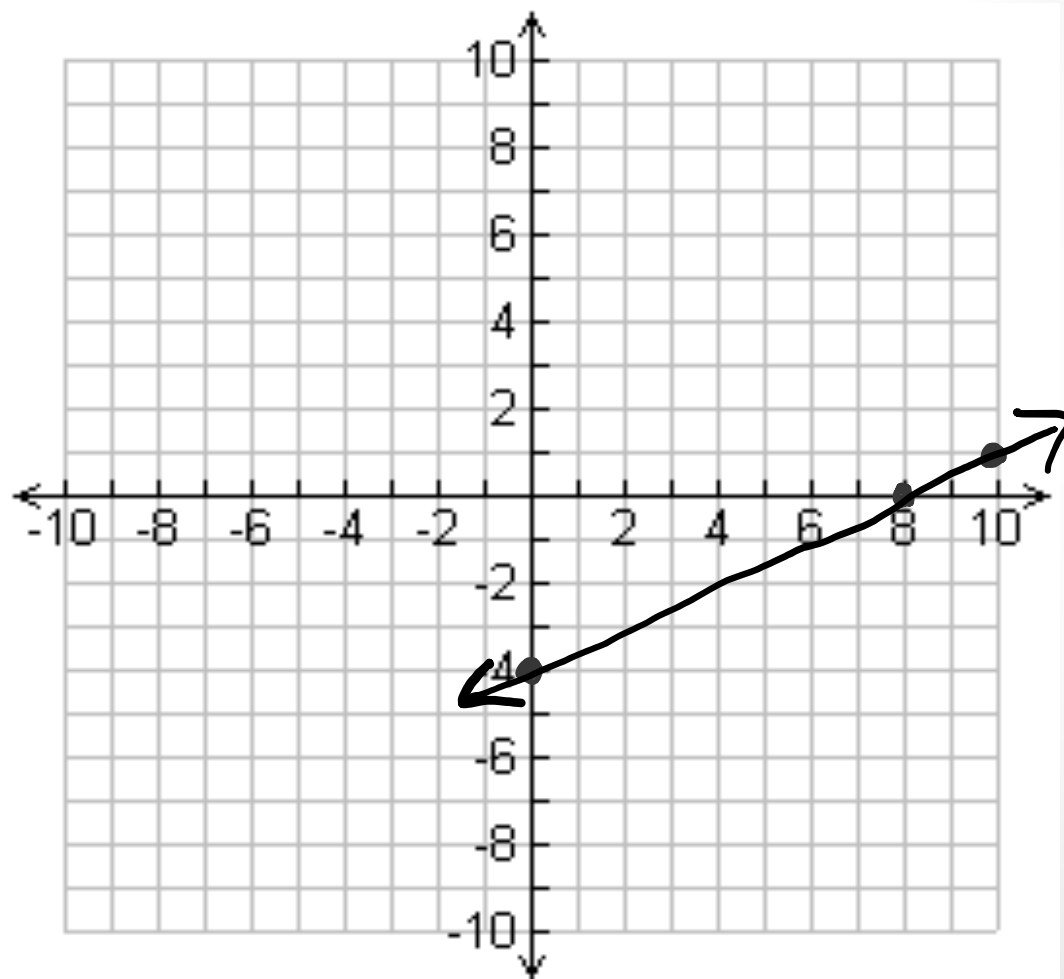


# How would you graph this?

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

$$\begin{array}{r} 1 \\ 0 \\ -4 \end{array} \quad \begin{array}{r} 10 \\ 8 \\ 0 \end{array}$$

x	y
10	1
8	0
0	-4



# Another strategy...

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

- $y - 3x = 8$   
 $+3x + 3x$

Not like terms – do not combine!

$$y = 8 + 3x \text{ or}$$

$$y = 3x + 8$$

# Getting y by itself

$$\begin{array}{r} x + y = 8 \\ -x \quad -x \\ \hline \end{array}$$

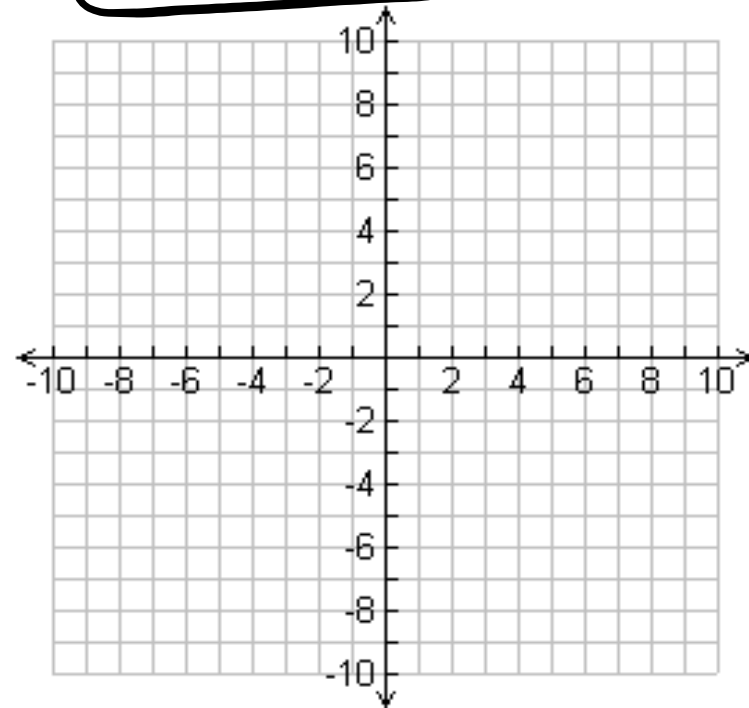
$y = 8 - x$

$$\begin{array}{r} 4x + 2y = 20 \\ -4x \quad -4x \\ \hline 2y = 20 - 4x \\ \frac{2y}{2} = \frac{20 - 4x}{2} \\ \hline \end{array}$$

$y = 10 - 2x$

$$\begin{array}{r} y + 4 = \frac{1}{2}x \\ -4 \quad -4 \\ \hline \end{array}$$

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



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

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

$-2x$   $-2x$

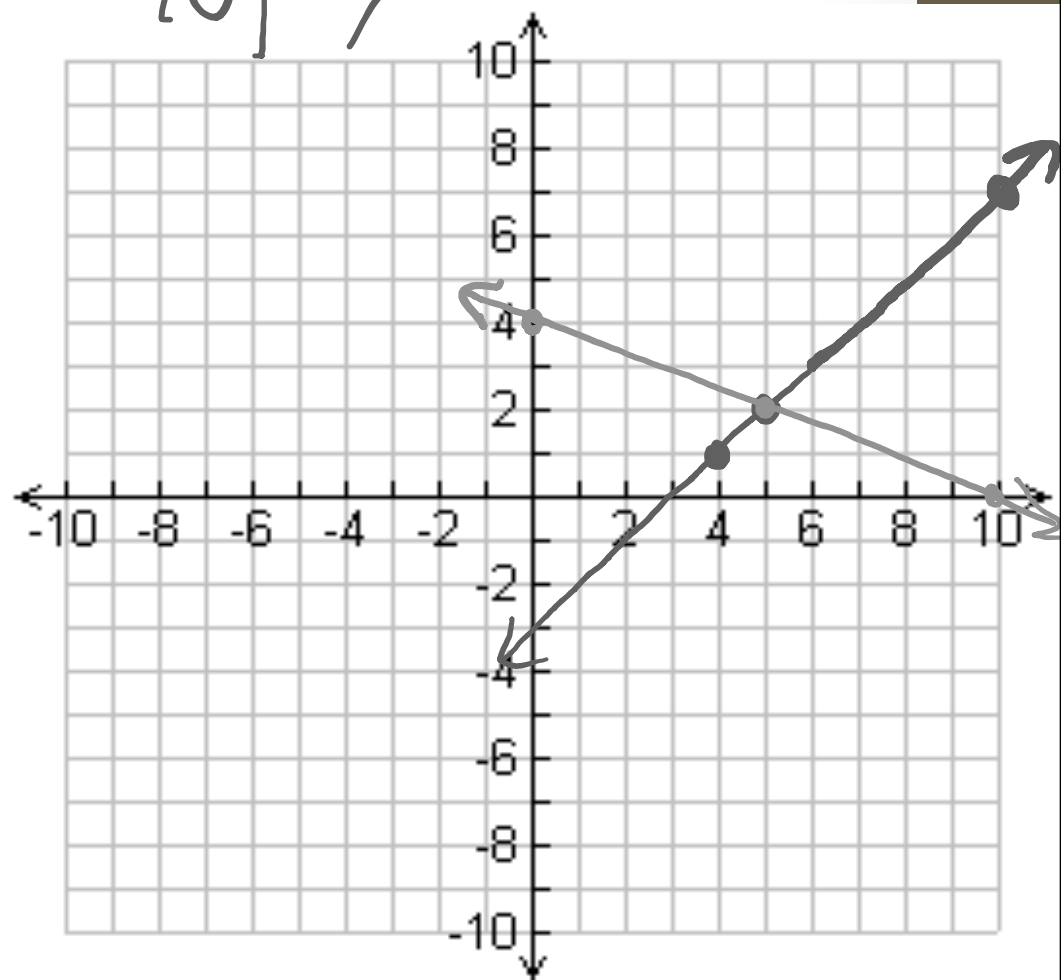
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$$\frac{5y}{5} = \frac{20 - 2x}{5}$$

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

$$(5, 2)$$

x	y
4	1
5	2
10	7





# Example 9

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

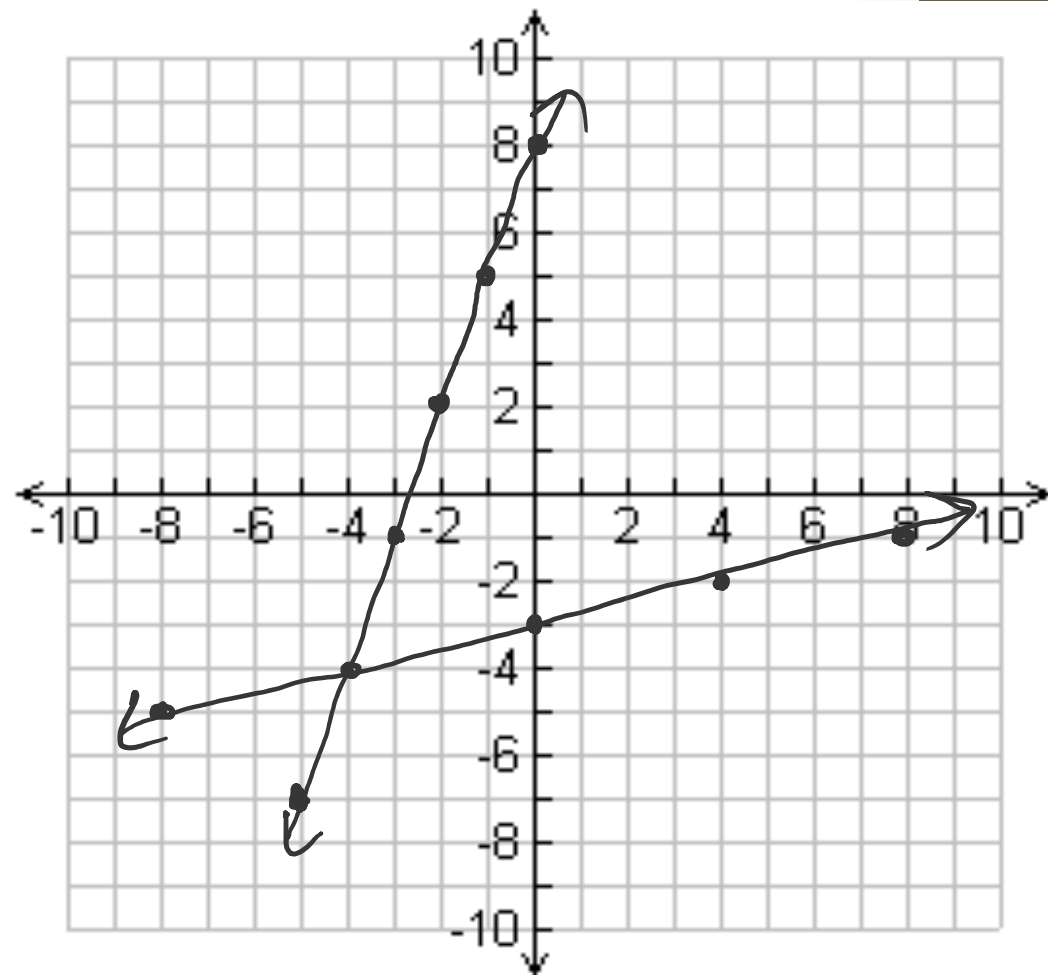
$+3x$        $+3x$

$-3$        $-3$

$$y = 8 + 3x$$

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

$$(-4, -4)$$

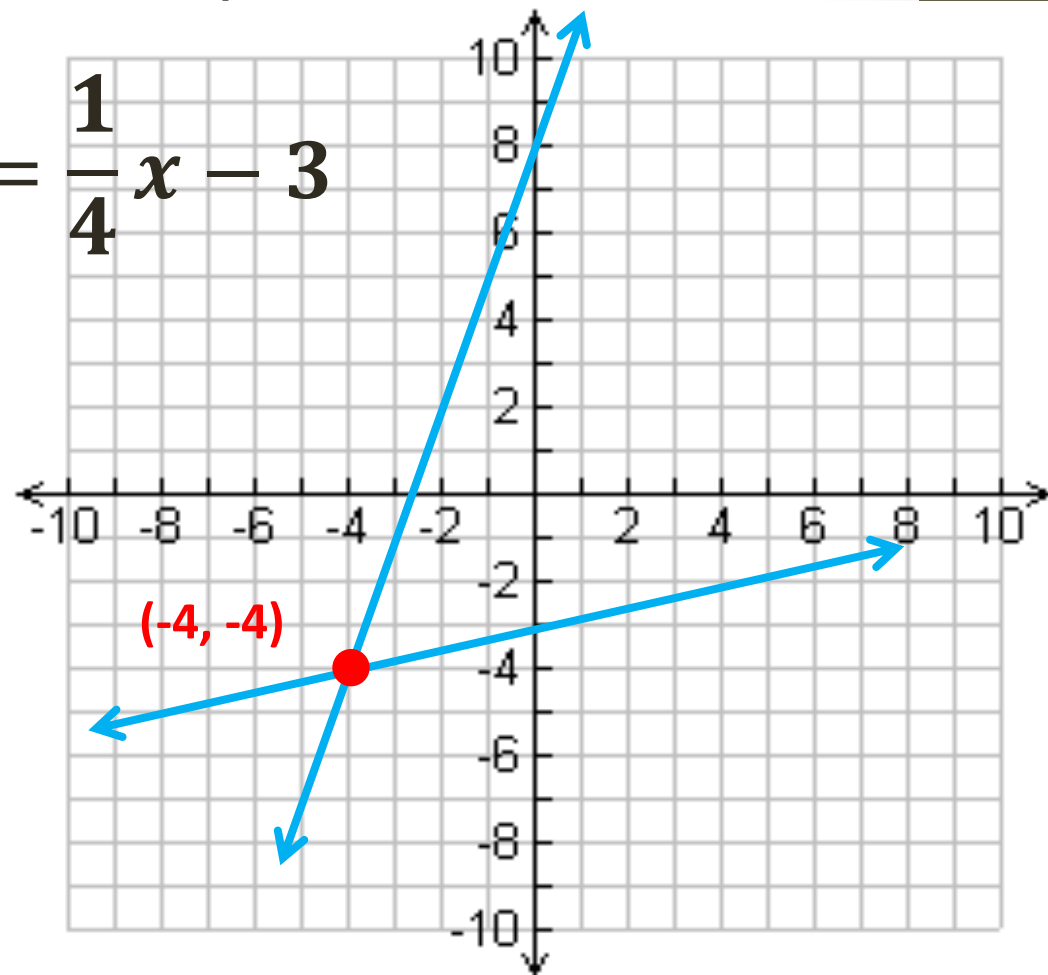


# Example 9

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

$$y = 3x + 8$$

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



## #8 & 9 Fixed...

8) Which of the possibilities could be point **M**? Which could be point **N**?

A. (9, 1)

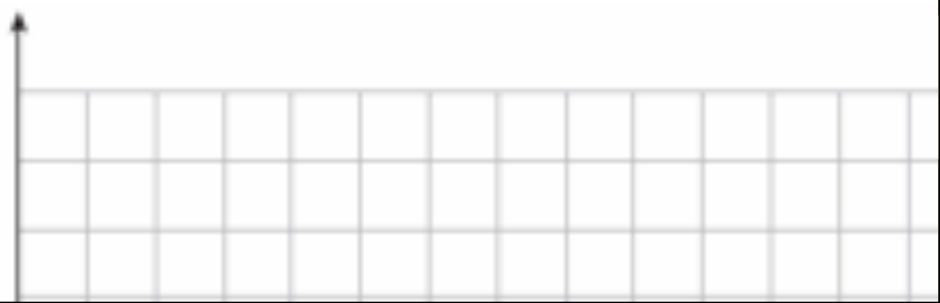
B. (5, 2)

C. (6, 4)

D. (7, 3)

9) Creative Crafts gives scrapbooking lessons for \$15 per hour plus a \$20 supply charge. Scrapbooks Incorporated gives lessons for \$20 per hour with no additional charges.

a) Write an equation for each situation where  $x$  is the number of hours and  $y$  is the total cost.



# Homework:

- **Solving Systems by Graphing worksheet**