

**Do Now**

Is the point  $(-2, 7)$  a solution to the equation  $2y - 3x = 18$ ?

$$2(7) - 3(-2) = 18$$

$$14 + 6 = 18$$

$$20 \neq 18$$

Not a  
Solution

Oct 20-8:55 AM

*Systems of Equations Graphically - Day 1***What is a system of linear equations?**

A system of linear equations is 2 linear equations with the same variables

Example:  $y = 4x - 1$   
 $2y - 4x = 8$

The solution to a system of linear equations is the ordered pair  $(x,y)$  that is a solution to BOTH equations in the system

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## Systems of Equations Grapically - Day 1

Tell whether the ordered pair is a solution to the system of equations

1)  $(1, -2)$   
 $y = 2x - 4$   
 $y = -3x + 2$

$$\begin{array}{l} y = 2x - 4 \\ -2 = 2(1) - 4 \\ -2 = 2 - 4 \\ -2 = -2 \\ \checkmark \end{array} \left\{ \begin{array}{l} y = -3x + 2 \\ -2 = -3(1) + 2 \\ -2 = -3 + 2 \\ -2 = -1 \\ \text{Not a Solution} \end{array} \right.$$

2)  $(3, -4)$   
 $2x - y = 10$   
 $y + 3x = 5$

$$\begin{array}{l} 2x - y = 10 \\ 2(3) - (-4) = 10 \\ 6 + 4 = 10 \\ 10 = 10 \\ \checkmark \end{array} \left\{ \begin{array}{l} y + 3x = 5 \\ (-4) + 3(3) = 5 \\ -4 + 9 = 5 \\ 5 = 5 \\ \checkmark \end{array} \right.$$

Yes it is a solution

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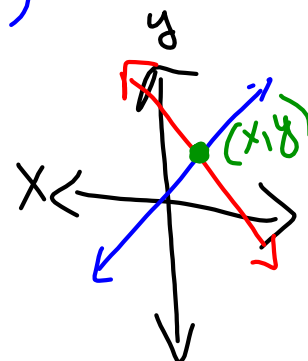
## Systems of Equations Grapically - Day 1

### Finding the solution to a system of equations

**Step 1:** Graph the equations on the same axes

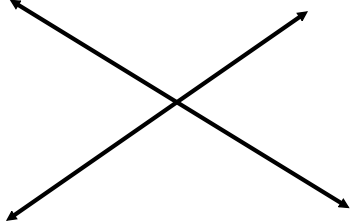
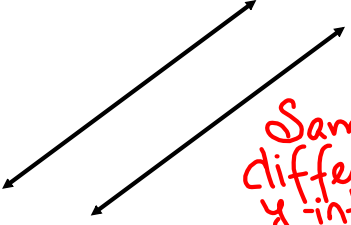
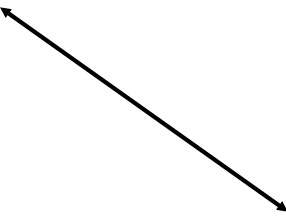
**Step 2:** Solution is the point where the lines intersect  $(x, y)$

**Step 3:** Check the point in BOTH original equations



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Three types of solutions to a system of linear equations:

<p><u>ONE SOLUTION</u> The lines intersect at one point</p>	
	<p><u>NO SOLUTION</u> The lines NEVER intersect Lines are <b>PARALLEL</b></p> <p><i>Same slope different y-intercept</i></p>
<p><u>INFINITE SOLUTIONS</u> Same line Same slope <b>AND</b> y-intercept</p>	

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1)  $y = x - 8$

$y = -2x + 1$

$y = x - 8$

$m = 1$

$b = -8$

$y = -2x + 1$

$m = -2$

$b = 1$

Solution (3, -5)

Check

$y = x - 8$

$-5 = (3) - 8$

$-5 = -5$

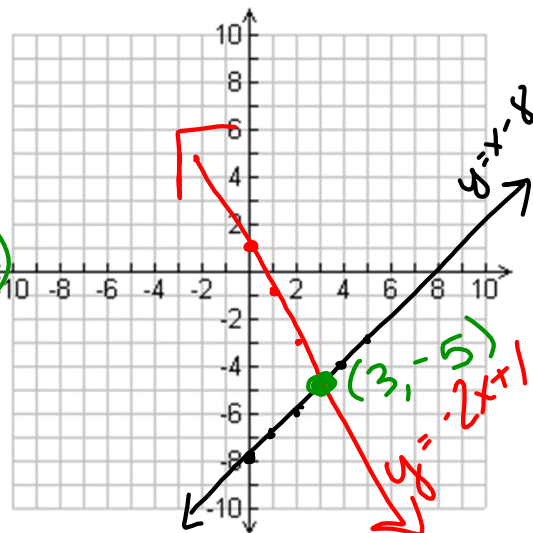
✓

$y = -2x + 1$

$-5 = -2(3) + 1$

$-5 = -6 + 1$

$-5 = -5$  ✓

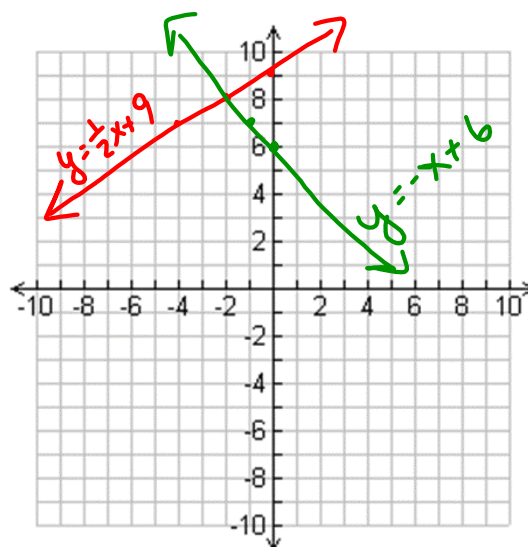


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$$2) y = \frac{1}{2}x + 9$$

$$y = -x + 6$$

$$(-2, 8)$$



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$$3) x + 2y = 4$$

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

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

$$\frac{2y = -x + 4}{2} \quad \frac{-x + 4}{2}$$

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

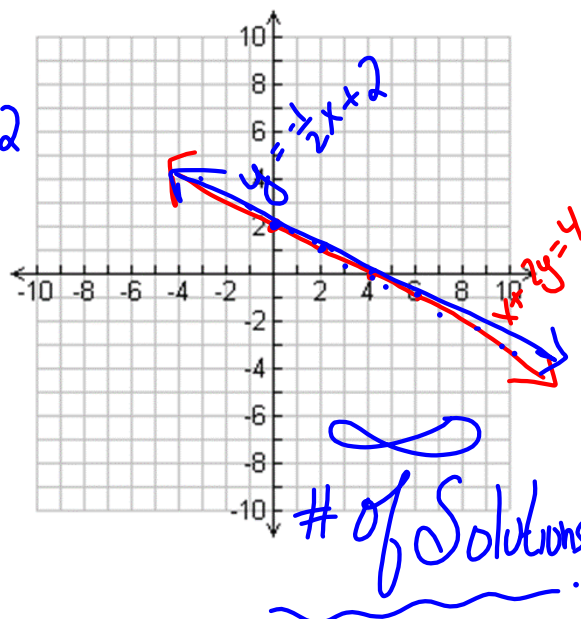
$$m = -\frac{1}{2}$$

$$b = 2$$

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

$$m = -\frac{1}{2}$$

$$b = 2$$



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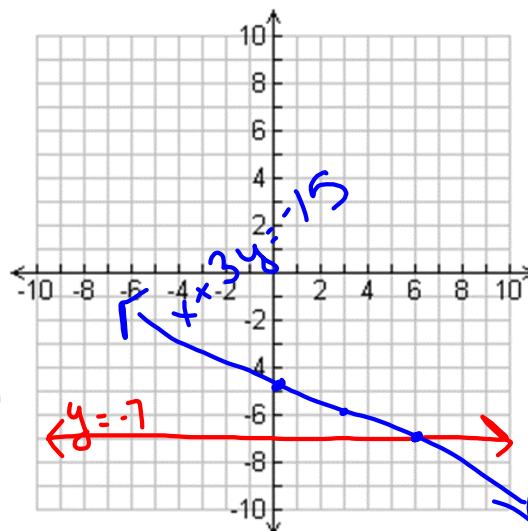
$$4) \quad x + 3y = -15$$
$$y = -7$$

$$y = -\frac{1}{3}x - 5$$

$$m = -\frac{1}{3}$$

$$b = -5$$

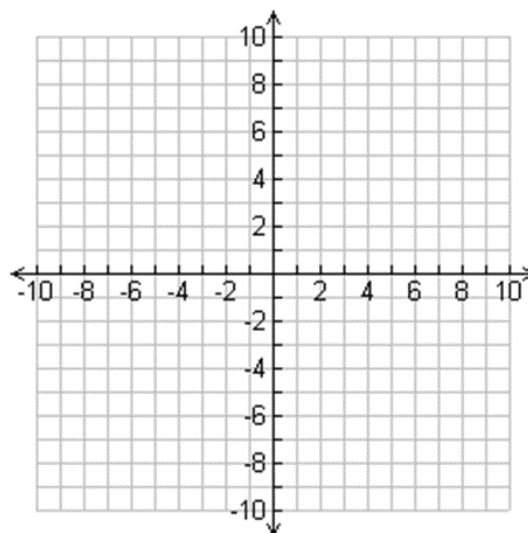
$$(6, -7)$$



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$$5) \quad 3x - 5y = -35$$
$$2x + y = -6$$

$$(-5, 4)$$



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6) Find the mistake and fix it:

$$y = x + 5$$

$$x - y = 2$$

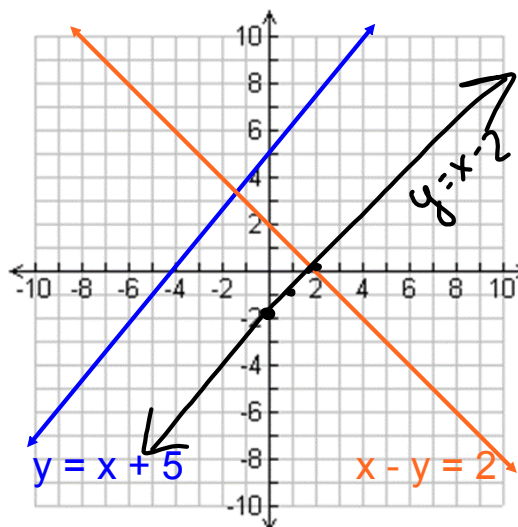


$$-y = -x + 2$$

$$y = x - 2$$

$$m = \frac{1}{1}$$

$$b = -2$$



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