

**4.1 – SOLVING SYSTEMS OF EQUATIONS BY GRAPHING:**

Solving two or more linear equations at the same time is a system of linear equations. A solution is any ordered pair that makes each equation work when you substitute it in for x and y.

Graphing – Find the point of intersection for the 2 lines. This is a solution.

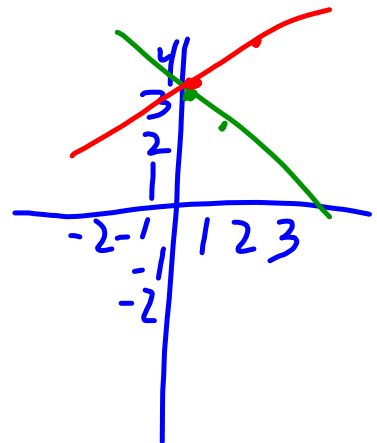
Graph the solution for the system of linear equations:

$$y = -2x + 3$$

$$y = x + 3$$

$$y = -2x + 3 \quad 3 = -2(0) + 3$$

$$y = x + 3 \quad 3 = 0 + 3$$



$y = -2x + 3$

x	calculation	y	(x, y)
0	$f(0) = -2(0) + 3$	3	0, 3
1	$f(1) = -2(1) + 3$	1	1, 1

$y = x + 3$

x	y
0	3
1	4

solution

0, 3  
x, y

$$y = -2x + 3$$

$$y = x + 3$$

Is  $(0, 3)$  a solution?

$$3 = -2(0) + 3$$

$$3 = 3 \checkmark$$

$$3 = 0 + 3$$

$$3 = 3 \checkmark$$

Is  $(4, -1)$  a solution  
for  $\begin{cases} x + 2y = 2 \\ x - 2y = 6 \end{cases}$

$$4 + 2(-1) = 2$$
$$4 - 2(-1) = 6$$

Evaluate. The ordered pair must work in both equations to be a solution

Is  $(-4, 3)$  a solution? No

$$-4 + 2(3) = 2$$
$$-4 - 2(3) = 6$$

$$2x + y = 5$$

$$2(0) + y = 5$$

$$y = 5$$

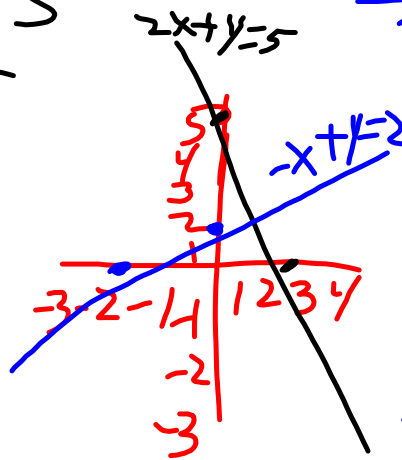
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$$2x + 0 = 5$$

$$2x = 5$$

$$x = \frac{5}{2}$$

x	y
0	5
$\frac{5}{2}$	0



$$-x + y = 2$$

$$-0 + y = 2$$

$$y = 2$$

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$$-x + 0 = 2$$

$$-x = 2$$

$$x = -2$$

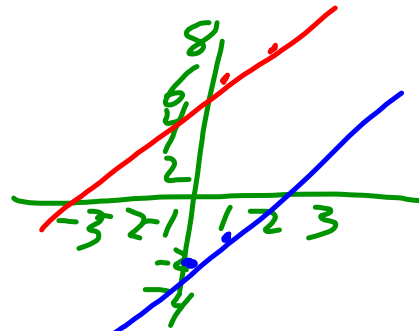
x	y
0	2
-2	0

$$2x - 2y = 4$$

$$y - x = 6$$

$$2x - 2y = 4$$

$$y - x = 6$$



$$2x - 2y = 4$$

-2x

-2x

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

$$y = x - 2$$

$$\begin{array}{r|l} x & y \\ 0 & -2 \\ 1 & -1 \end{array}$$

$$y - x = 6$$

$$y = x + 6$$

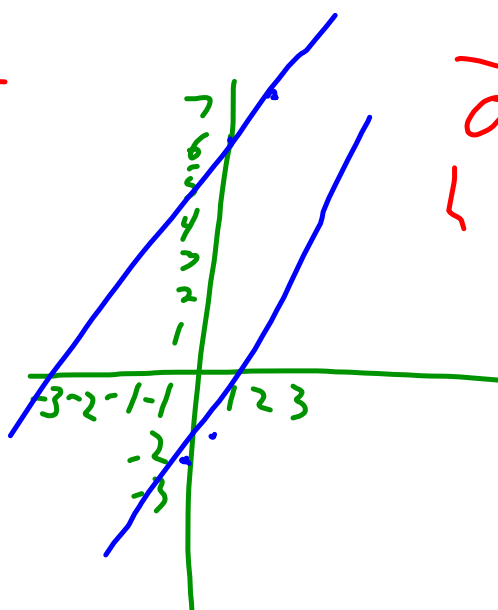
$$\begin{array}{r|l} x & y \\ 0 & 6 \\ 1 & 7 \end{array}$$

$$y = x - 2$$

$$y = x + 6$$

x	y
0	-2
1	-1

x	y
0	6
1	7





$$y = 2x + 3$$

$$-4x + 2y = 6$$

$$y = 2x + 3$$

$$\frac{2y}{2} = \frac{4x}{2} + \frac{6}{2}$$

$$y = 2x + 3$$

$$4y - 2x = 6$$

$$8y = 4x - 12$$

$$4y - 2x = 6$$

$$\frac{4y}{4} = \frac{2x}{4} + \frac{6}{4}$$

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

$$\frac{8y}{8} = \frac{4x}{8} - \frac{12}{8}$$

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

