

Warm-Up:

Graph the following lines on the same coordinate plane.

1) $3x + 4y = 12$

$$\begin{array}{r} -3x \quad -3x \\ \hline 4y = -3x + 12 \\ \frac{4y}{4} = \frac{-3x}{4} + \frac{12}{4} \\ y = -\frac{3}{4}x + 3 \end{array}$$

2) $-5x - 2y = 8$

$$\begin{array}{r} +5x \quad +5x \\ \hline -2y = 5x + 8 \\ \frac{-2y}{-2} = \frac{5x}{-2} + \frac{8}{-2} \\ y = -\frac{5}{2}x - 4 \end{array}$$



Section 3-1: Solving Systems of Equations by Graphing

A **system of equations** is two or more equations sharing the same variables and a common solution.

One way to solve a system of equations is by graphing and finding the point of intersection.

Examples:

1) Solve the system of equations by completing a table.

$$x + y = 3$$

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

x	y
13	-10
0	3
-1	2
-2	1

x	y
0	-6
2	-2
3	0

$$\begin{aligned} -2(0) + y &= -6 \\ -2(2) + y &= -6 \\ -4 + y &= -6 \\ -2(3) + y &= -6 \\ -6 + y &= -6 \end{aligned}$$

$(3, 0)$

Examples:

2) Solve the system of equations by graphing.

$$x - 2y = 0$$

$$x + y = 6$$

$$\begin{array}{r} x - 2y = 0 \\ -x \quad \quad -x \\ \hline \end{array}$$

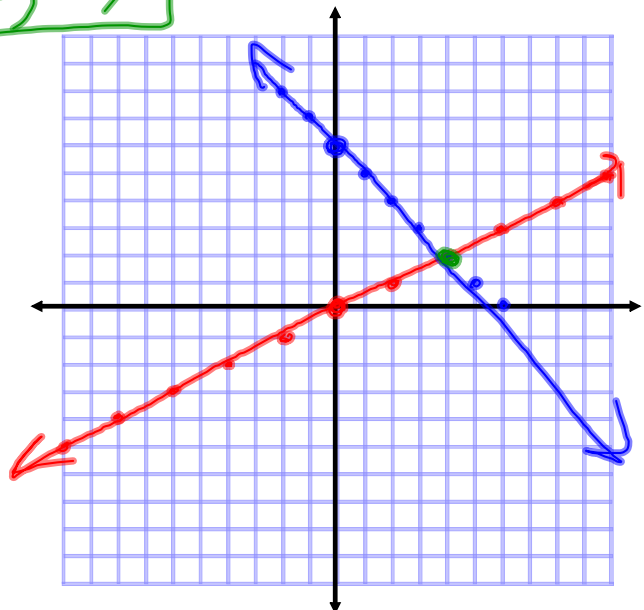
$$\frac{-2y}{-2} = \frac{-x}{-2}$$

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

$$\begin{array}{r} x + y = 6 \\ -x \quad \quad -x \\ \hline \end{array}$$

$$y = -x + 6$$

$(4, 2)$



Examples:

3) Solve the system of equations.

$$x - y = 5$$

$$x + 2y = -4$$

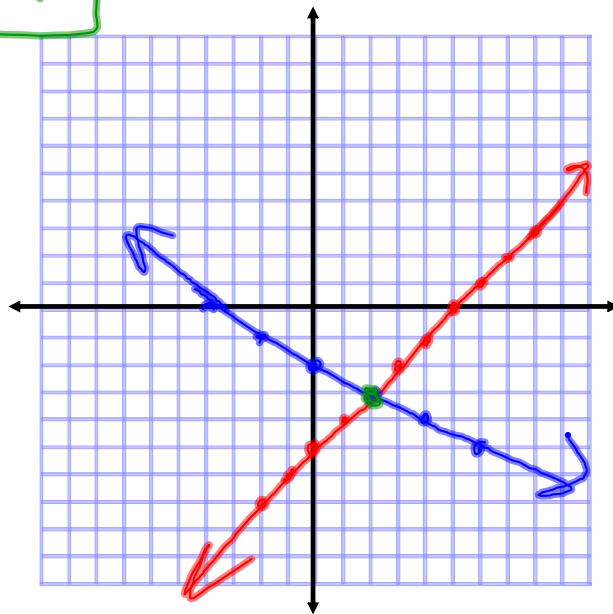
$$\frac{-y}{-1} = \frac{-x+5}{-1}$$

$$y = x - 5$$

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

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

$$(2, -3)$$



Examples:

4) Solve the system of equations.

$$9x - 6y = -6$$

$$6x - 4y = -4$$

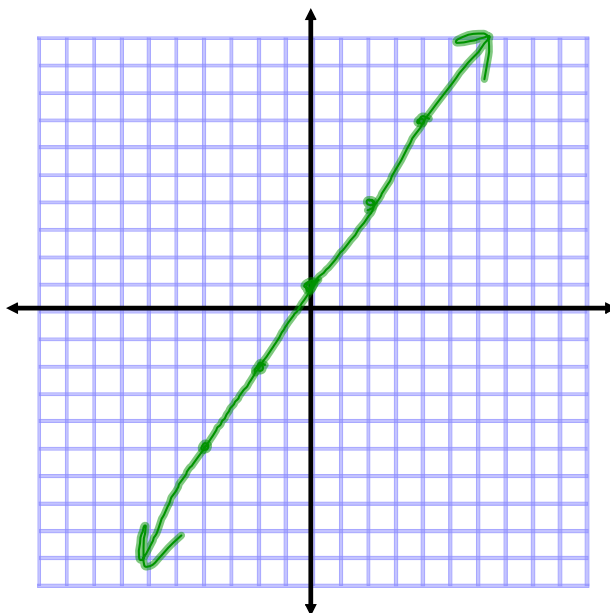
$$-6y = -9x - 6$$

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

$$-4y = -6x - 4$$

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

Inf. Many Solutions



Examples:

5) Solve the system of equations.

$$15x - 6y = 0$$

$$5x - 2y = 10$$

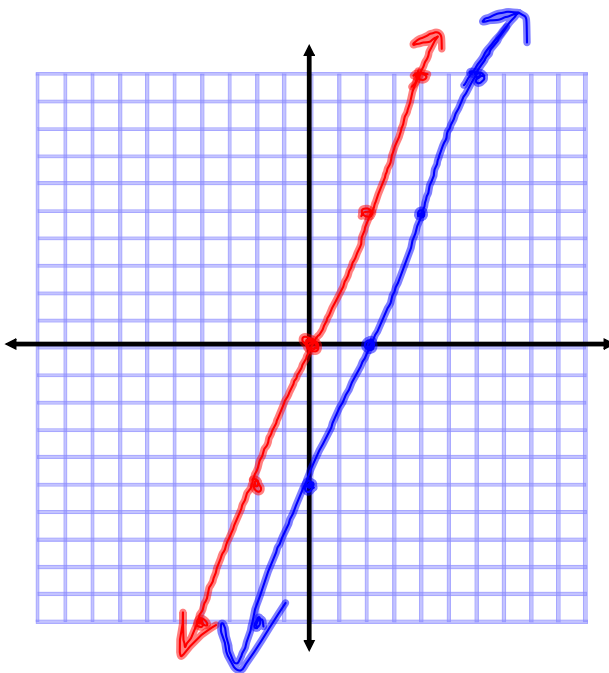
$$-6y = -15x$$

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

$$-2y = -3x + 10$$

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

No Solution



Examples:

6) Jim and Eliza have competing bakeries. They both sell regular donuts and sugar cookies. Jim sells a cookie for \$0.75 and a donut for \$0.50. Eliza sells both donuts and cookies for \$0.60 each. Jim made a net profit of \$9.00 in the first hour he was open, and Eliza made a net profit of \$8.40 in the same time. If they sold the same number of donuts and cookies, how many did they sell of each?

$$x = \text{donuts} \quad y = \text{cookies}$$

$$.50x + .75y = 9.00$$

$$.60x + .60y = 8.40$$

$$\frac{.75y}{.75} = \frac{-.50x + 9.00}{.75}$$

$$y = -\frac{2}{3}x + 12$$

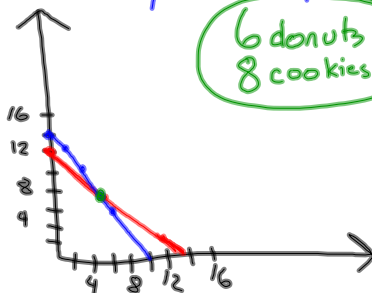
$$\frac{.60y}{.60} = \frac{-.60x + 8.40}{.60}$$

$$y = -x + 14$$

$$y = -\frac{2}{3}x + 12 \quad y = -x + 14$$

(6, 8)

6 donuts
8 cookies



Homework: Practice 3-1