

NOTES: Section 7.1 – Graphing Linear Systems

Goals: #1 - I can solve a linear system using the graphing method and then check my solution algebraically.

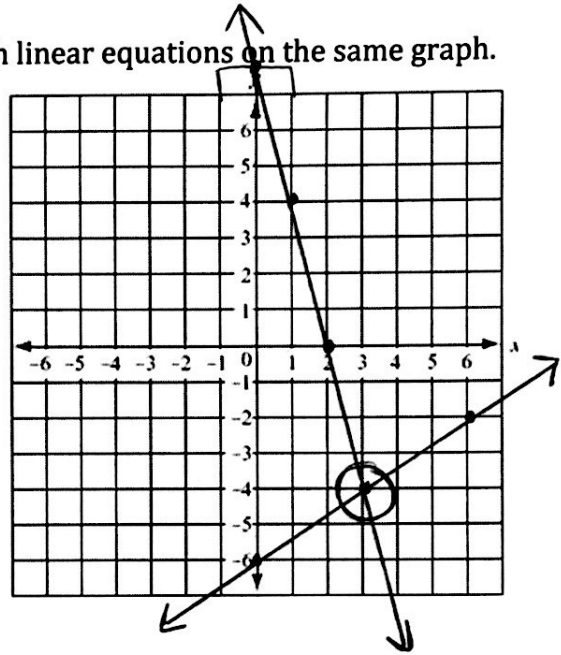


Homework: Section 3.1 Worksheet

Exploration #1: Work with a partner. Graph both linear equations on the same graph.

$$\begin{aligned} 4x + y &= 8 \\ -4x &\quad -4x \\ \hline y &= -4x + 8 \end{aligned}$$

$$\begin{aligned} 2x - 3y &= 18 \\ -2x &\quad -2x \\ \hline -3y &= -2x + 18 \\ \frac{-3y}{-3} &= \frac{-2x}{-3} + \frac{18}{-3} \\ y &= \frac{2}{3}x - 6 \end{aligned}$$



Circle where these lines intersect. Can you check if your answer is correct?

$(3, -4)$

$$\begin{aligned} 4(3) + (-4) &\stackrel{?}{=} 8 \\ 12 - 4 &\stackrel{?}{=} 8 \\ 8 &= 8 \checkmark \end{aligned}$$

$$\begin{aligned} 2(3) - 3(-4) &\stackrel{?}{=} 18 \\ 6 + 12 &\stackrel{?}{=} 18 \\ 18 &= 18 \checkmark \end{aligned}$$

Notes:

A system of linear equations consists of two linear equations. (two lines)

A solution of a system of linear equations, is an ordered pair (x, y) where the graphs of the equations in a system intersect.

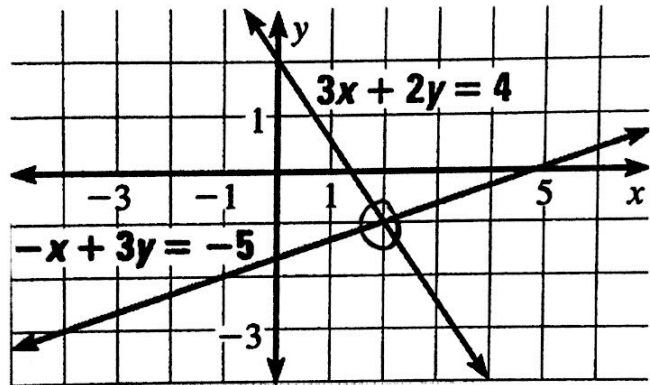
Name: _____ Hour: _____ Date: _____

Example #1: Use the graph below to estimate the solution of the linear system. Then check your solution algebraically.

$(2, -1)$

$$\begin{aligned} 3(2) + 2(-1) &\stackrel{?}{=} 4 \\ 6 - 2 &\stackrel{?}{=} 4 \\ 4 &= 4 \checkmark \end{aligned}$$

$$\begin{aligned} -(2) + 3(-1) &\stackrel{?}{=} -5 \\ -2 - 3 &\stackrel{?}{=} -5 \\ -5 &= -5 \checkmark \end{aligned}$$



Example #2: Solve the linear system by graphing. Check your solution.

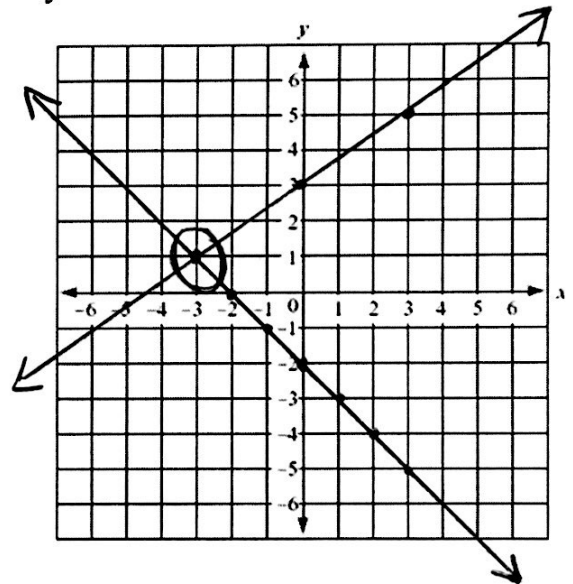
$(-3, 1)$

$$\begin{aligned} (-3) + (1) &\stackrel{?}{=} -2 \\ -3 + 1 &\stackrel{?}{=} -2 \\ -2 &= -2 \checkmark \end{aligned}$$

$$\begin{aligned} x + y &= -2 \\ -x &\quad -x \\ \hline y &= -x - 2 \end{aligned}$$

$$\begin{aligned} 2(-3) - 3(1) &\stackrel{?}{=} -9 \\ -6 - 3 &\stackrel{?}{=} -9 \\ -9 &= -9 \checkmark \end{aligned}$$

$$\begin{aligned} 2x - 3y &= -9 \\ -2x &\quad -2x \\ \hline -3y &= -2x - 9 \\ \frac{-3y}{-3} &= \frac{-2x}{-3} - \frac{9}{-3} \\ y &= \frac{2}{3}x + 3 \end{aligned}$$



You practice: Solve the linear system by graphing. Check your solution.

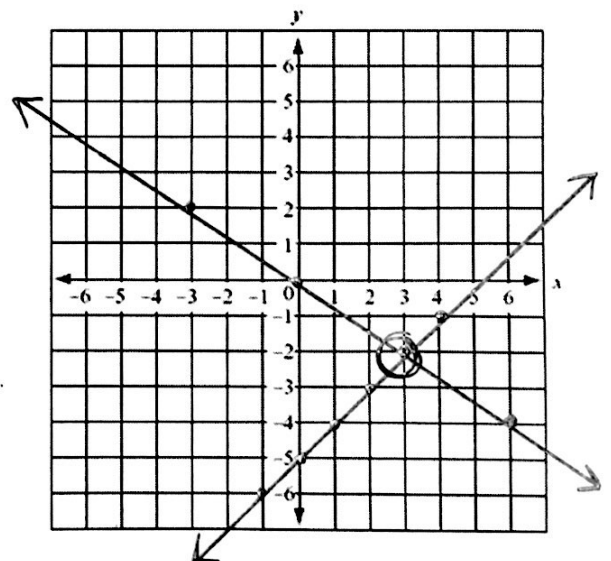
$(3, -2)$

$$\begin{aligned} (3) - (-2) &\stackrel{?}{=} 5 \\ 3 + 2 &\stackrel{?}{=} 5 \\ 5 &= 5 \checkmark \end{aligned}$$

$$\begin{aligned} x - y &= 5 \\ -x &\quad -x \\ \hline -y &= -x + 5 \\ \frac{-y}{-1} &= \frac{-x}{-1} + \frac{5}{-1} \\ y &= x - 5 \end{aligned}$$

$$\begin{aligned} 2(3) + 3(-2) &\stackrel{?}{=} 0 \\ 6 - 6 &\stackrel{?}{=} 0 \\ 0 &= 0 \checkmark \end{aligned}$$

$$\begin{aligned} 2x + 3y &= 0 \\ -2x &\quad -2x \\ \hline 3y &= -2x \\ \frac{3y}{3} &= \frac{-2x}{3} \\ y &= -\frac{2}{3}x \end{aligned}$$



Example #3: Tell whether the ordered pair is a solution to the linear system.

1. (1, 3)

$$x + y = 4$$

$$2x + y = 5$$

$$(1) + (3) \stackrel{?}{=} 4$$

$$2(1) + (3) \stackrel{?}{=} 5$$

$$1 + 3 \stackrel{?}{=} 4$$

$$2 + 3 \stackrel{?}{=} 5$$

$$4 = 4 \checkmark$$

$$5 = 5 \checkmark$$

Yes

2. (-3, -2)

$$x - y = -2$$

$$x + y = -4$$

$$(-3) - (-2) \stackrel{?}{=} -2$$

$$-3 + 2 \stackrel{?}{=} -2$$

$$-1 \neq -2$$

No

Example #4: You are the Webmaster of the Web sites for the science club and for the math club. Assuming that the number of visits at each site can be represented by a linear function, use the information in the table to predict when the number of daily visits to the two sites will be the same.

	Club	Current daily visits	Increase (daily visits per month)
S	Science	400	25
M	Math	200	50

$$S = 400 + 25m$$

$$M = 200 + 50m$$

(7, 600)

After 7 months, the Science & Math club web sites will both have 600 daily visits.

