4.2 Notes
Day 2

SOLVE LINEAR SYSTEMS BY GRAPHING AND WORD PROBLEMS!

Name KEY
Per ____ Date ____

SOLVING A LINEAR SYSTEM BY GRAPHING:

Step 1: Graph each line, using the appropriate form.
Step 2: Estimate the coordinates of the point of intersection.
Step 3: Check the coordinates algebraically.

Use the graph to **solve** the system. Then, **check** your solution algebraically.

1) $\begin{cases} 2x+7y=7 \\ 3x-2y=9 \end{cases}$

$m = -\frac{2}{7}$

$m = \frac{3}{2}$

Graphing is unreliable!

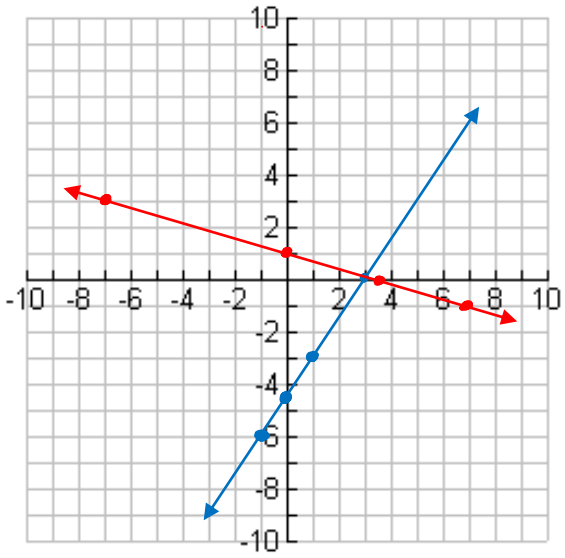
$-3(2x+7y=7) \rightarrow -6x-21y=-21$
$2(3x-2y=9) \rightarrow 6x-4y=18$
$-25y=-3$

$y=\frac{3}{25}$

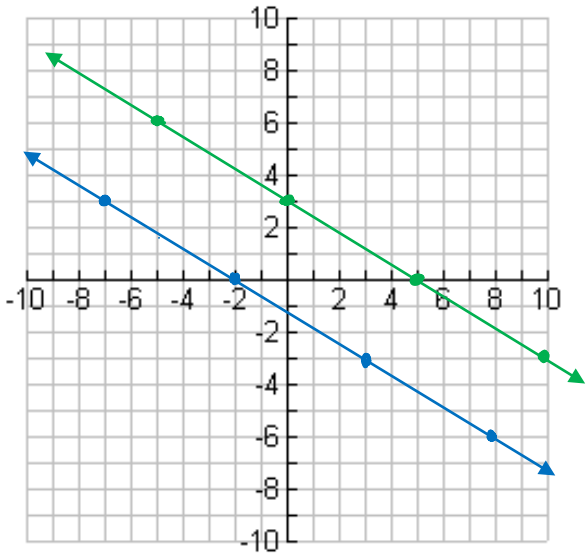
$4x+14y=14$
$21x-14y=63$
$25x=77$

$x=\frac{77}{25} \rightarrow 3\frac{2}{25}$

$\left(\frac{77}{25}, \frac{3}{25}\right)$

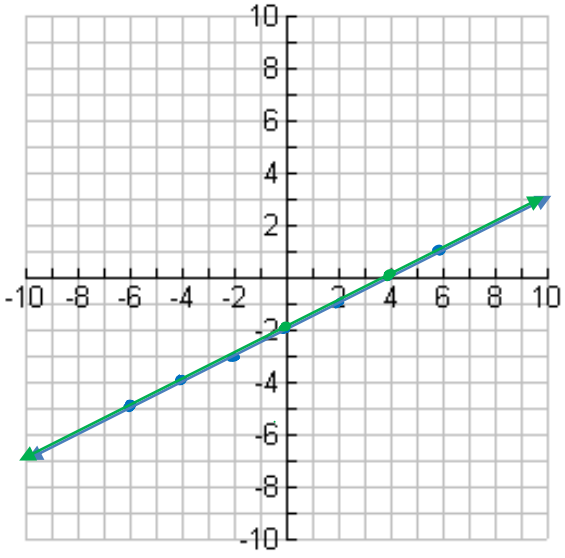


2) $\begin{cases} y-3=-\frac{3}{5}(x+7) \\ 3x+5y=15 \end{cases}$



No solution, parallel lines.

3) $\begin{cases} y+5=\frac{1}{2}(x+6) \\ 4x-8y=16 \end{cases}$



All points (∞ points) on the line $4x-8y=16$

SYSTEMS APPLICATION PROBLEMS

4) Find the value of the sum of two numbers if their sum is 2 and their difference is 4.

Let x = one number
y = other number

$$\begin{cases} x + y = 2 \\ x - y = 4 \end{cases}$$

5) The school that Stephen goes to is selling tickets to a choral performance. On the first day tickets sales, the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

Let x = price for a senior citizen ticket
y = price for a child's ticket

$$\begin{cases} 3x + 1y = 38 \\ 3x + 2y = 52 \end{cases}$$

6) Two angles are supplementary. The larger angle is 48 degrees more than 10 times the smaller angle. Find the measure of each angle.

Let x = measure of larger angle
y = measure of smaller angle

$$\begin{cases} x + y = 180 \\ x = 48 + 10y \end{cases}$$

7) Suppose it takes a small airplane flying with a head wind 16 hours to travel 1800 miles. However, when flying with a tail wind, the airplane can travel the same distance in only 9 hours. Find the rate of speed of the wind and the air speed of the airplane

$D = R \cdot T$

x = rate of plane y = rate of wind

$1800 = (x - y)16$ ← speed going against wind

$1800 = (x + y)9$ ← speed with wind helping

$$\begin{cases} 16x - 16y = 1800 \\ 9x + 9y = 1800 \end{cases}$$