

Name: _____ Period: _____ Date: _____

SYSTEM OF LINEAR INEQUALITIES Bell Work

Solve the following inequalities and graph its solution

1.
$$\begin{cases} 4x + y < 8 \\ -x + y \geq 2 \end{cases}$$

2.
$$\begin{cases} y - x < 4 \\ 2x + y \geq 1 \end{cases}$$

3.
$$\begin{cases} 3x - y \geq 1 \\ x \leq 2 \end{cases}$$

4.
$$\begin{cases} 2x + y \leq 6 \\ x + y \geq 0 \\ y \leq 4 \end{cases}$$

Solve the following word problem:

5. Alex is preparing a party and he is buying the supplies at the Market. Regular sized boxes of spoons contain enough for 20 persons, while value-pack boxes contain enough for 30 persons. He needs at least enough spoons for the 60 guests who plan to attend. Write and graph a system of linear inequalities.

SYSTEM OF LINEAR INEQUALITIES Bell Work**ANSWERS**

Solve the following inequalities and graph its solution

$$1. \begin{cases} 4x + y < 8 \\ -x + y \geq 2 \end{cases}$$

We have to graph each of the linear function that compound the system. One easy way to graph each linear function is to find its intercepts with the axes.

- $y = -4x + 8$

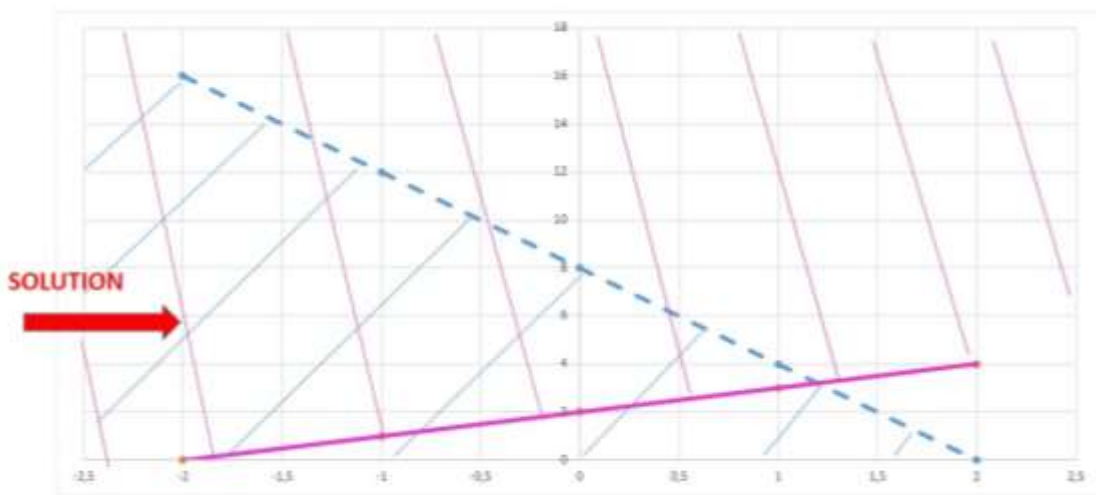
$$x = 0 \rightarrow y = 8 \rightarrow (0,8)$$

$$y = 0 \rightarrow x = 2 \rightarrow (2,0)$$

- $y = x + 2$

$$x = 0 \rightarrow y = 2 \rightarrow (0,2)$$

$$y = 0 \rightarrow x = -2 \rightarrow (-2,0)$$



The segmented line is because the border of the line does not belong to the solution and the straight line is because the border of the line belongs to the solution.

Proving with the point $(-1,4)$ that belongs to the solution region to verify if it satisfies the inequalities:

$$y < -4x + 8 \rightarrow 4 < -4(-1) + 8 \rightarrow 4 < 12$$

$$y \geq x + 2 \rightarrow 4 \geq -1 + 2 \rightarrow 4 > 1$$

SYSTEM OF LINEAR INEQUALITIES Bell Work

2.
$$\begin{cases} y - x < 4 \\ 2x + y \geq 1 \end{cases}$$

We have to graph each of the linear function that compound the system. One easy way to graph each linear function is to find its intercepts with the axes.

- $y = x + 4$

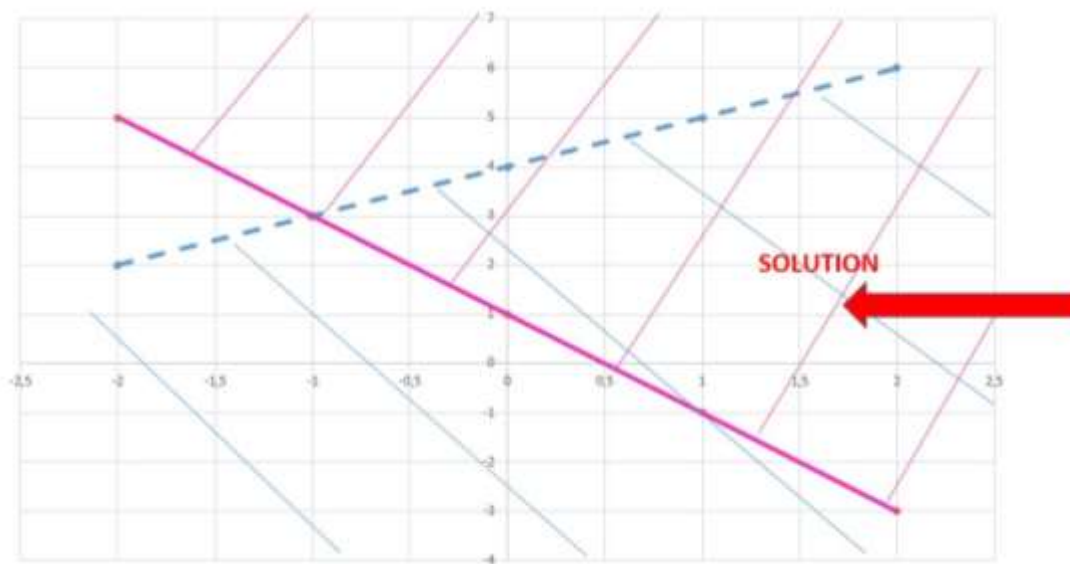
$$x = 0 \rightarrow y = 4 \rightarrow (0,4)$$

$$y = 0 \rightarrow x = -4 \rightarrow (-4,0)$$

- $y = -2x + 1$

$$x = 0 \rightarrow y = 1 \rightarrow (0,1)$$

$$y = 0 \rightarrow x = 1/2 \rightarrow (1/2,1)$$



The segmented line is because the border of the line does not belong to the solution and the straight line is because the border of the line belongs to the solution.

Proving with the point (1,2) that belongs to the solution region to verify if it satisfies the inequalities:

SYSTEM OF LINEAR INEQUALITIES Bell Work

$$y - x < 4 \rightarrow 2 - 1 < 4 \rightarrow 1 < 4$$

$$2x + y \geq 1 \rightarrow 2(1) + 2 \geq 1 \rightarrow 4 > 1$$

$$3. \begin{cases} 3x - y \geq 1 \\ x \leq 2 \end{cases}$$

This is the best way to represent the system:

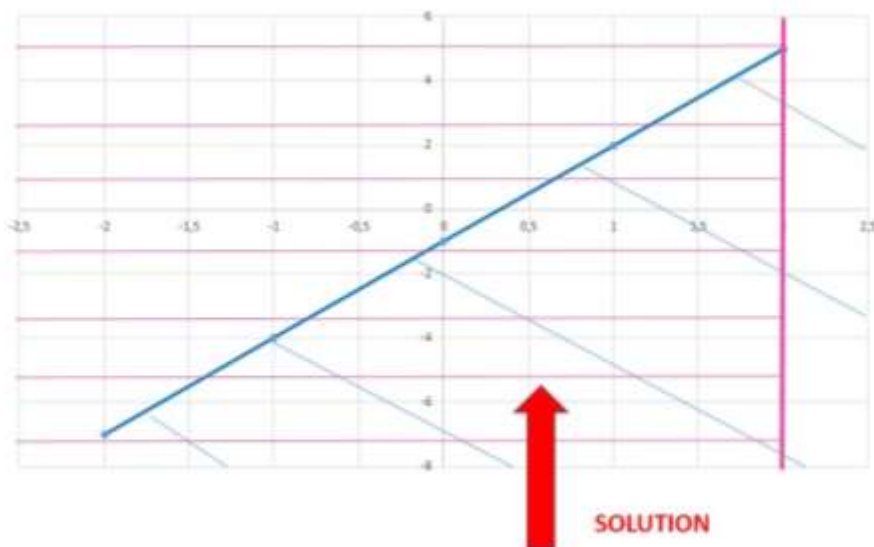
$$\begin{cases} y \leq 3x - 1 \\ x \leq 2 \end{cases}$$

We have to graph each of the linear function that compound the system. One easy way to graph each linear function is to find its intercepts with the axes.

- $y = 3x - 1$

$$x = 0 \rightarrow y = -1 \rightarrow (0, -1)$$

$$y = 0 \rightarrow x = 1/3 \rightarrow (1/3, 0)$$



Proving with the point (1,-4) that belongs to the solution region to verify if it satisfies the inequalities:

$$y \leq 3x - 1 \rightarrow -4 \leq 3(1) - 1 \rightarrow -4 < 2$$

SYSTEM OF LINEAR INEQUALITIES Bell Work

$$x \leq 2 \rightarrow 1 \leq 2$$

$$4. \begin{cases} 2x + y \leq 6 \\ x + y \geq 0 \\ y \leq 4 \end{cases}$$

We have to graph each of the linear function that compound the system. One easy way to graph each linear function is to find its intercepts with the axes.

- $y = -2x + 6$

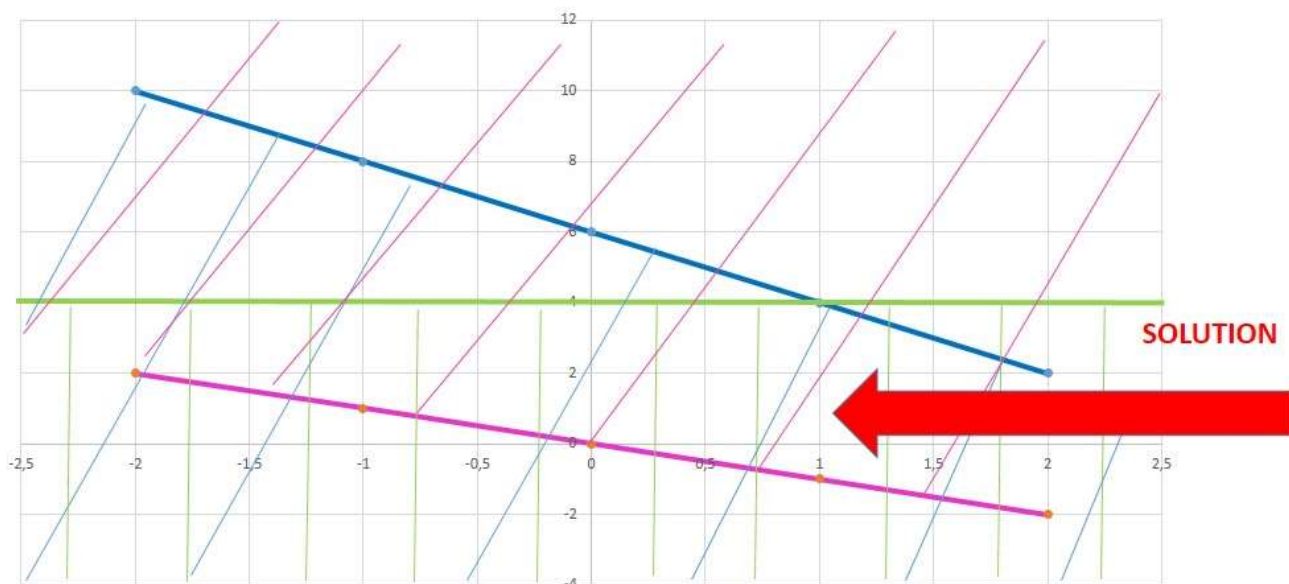
$$x = 0 \rightarrow y = 6 \rightarrow (0,6)$$

$$y = 2 \rightarrow x = 2 \rightarrow (2,2)$$

- $y = -x$

$$x = 0 \rightarrow y = 0 \rightarrow (0,0)$$

$$y = 2 \rightarrow x = -2 \rightarrow (-2,2)$$



Proving with the point (1,2) that belongs to the solution region to verify if it satisfies the inequalities:

$$2x + y \leq 6 \rightarrow 2(1) + 2 \leq 6 \rightarrow 4 < 6$$

SYSTEM OF LINEAR INEQUALITIES Bell Work

$$x + y \geq 0 \rightarrow 1 + 2 \geq 0 \rightarrow 3 \geq 0$$

$$y \leq 4 \rightarrow 2 \leq 4$$

Solve the following word problem:

5. Alex is preparing a party and he is buying the supplies at the Market. Regular sized boxes of spoons contain enough for 40 persons, while value-pack boxes contain enough for 20 persons. He needs at least enough spoons for the 60 guests who plan to attend. Write and graph a system of linear inequalities.

SOLUTION

Let's define the variables that represent the system:

X= Number of regular boxes of spoons.

Y= Number of value-packs boxes of spoons.

- The statement says 40 regular size spoons and 20 value-pack spoons for at least 60 guests , so we have:

$$40x + 20y \geq 60 \rightarrow \text{simplifying} \rightarrow 2x + y \geq 3$$

- As we know the amount of spoons can never be negative, so:

$$x \geq 0 \quad \text{and} \quad y \geq 0$$

We have to graph each of the linear function that compound the system. One easy way to graph each linear function is to find its intercepts with the axes.

- $y = -2x + 3$

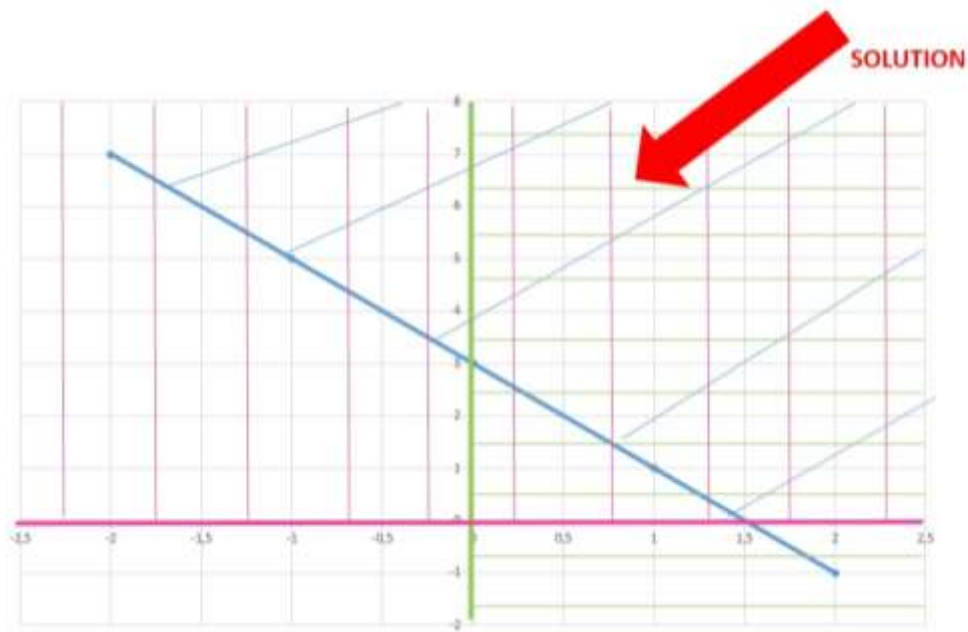
$$x = 0 \rightarrow y = 3 \rightarrow (0,3)$$

$$y = 0 \rightarrow x = \frac{3}{2} \rightarrow (3/2,0)$$

Graphing:

Name: _____ Period: _____ Date: _____

SYSTEM OF LINEAR INEQUALITIES Bell Work



Proving with the point (2, 2) that belongs to the solution region to verify if it satisfies the inequalities:

$$2x + y \geq 3 \rightarrow -2(2) + 2 \geq 3 \rightarrow 6 \geq 3$$

$$y \geq 0 \rightarrow 2 \geq 0 \quad \text{and} \quad x \geq 0 \rightarrow 2 \geq 0$$