

## Bellwork: Algebra 1

1. Happy Friday!!
2. Write down your homework in your planner.
3. You need a ruler.
4. Answer the following question on your FRIDAY Bellwork:

**What are the possible solutions to a system of linear equations?**

no solution,  $\infty$ , one solution

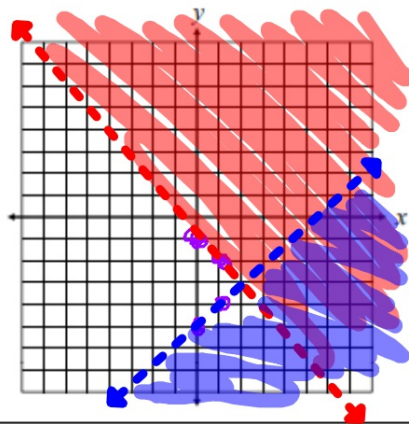
**What are the possible solutions to a system of inequalities?**

$\infty$ , one solution, no solution

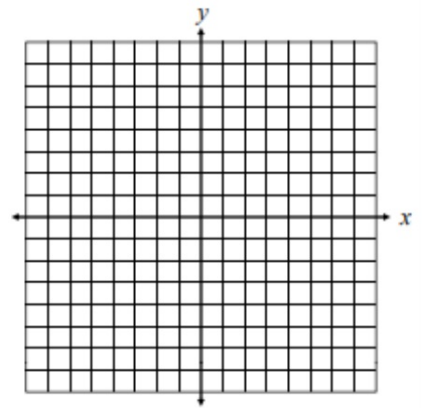
Main Ideas/Questions	Notes/Examples
<b>Systems of Linear Inequalities</b>	Any 2 or more inequalities on the same coordinate plane.
<b>SOLUTION</b> to a System of Linear Inequalities	Any point that satisfies both (all) inequalities (shaded areas overlap)

**Directions:** Graph each system of linear inequalities to show all possible solutions.

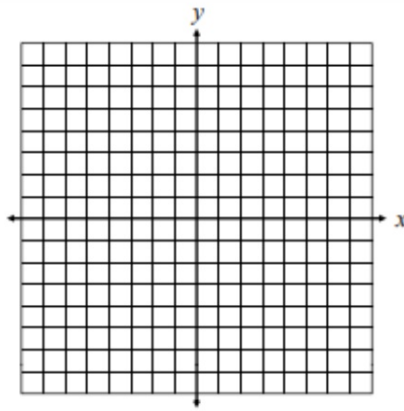
1. 
$$\begin{cases} y > -x - 1 \\ y < x - 5 \end{cases}$$



2. 
$$\begin{cases} y < \frac{1}{3}x + 7 \\ y \geq -x + 4 \end{cases}$$



$$3. \begin{cases} x - 4y \leq 24 \\ y \leq 2x + 1 \end{cases}$$

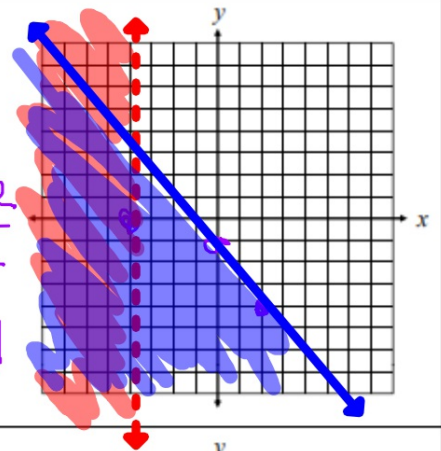


$$4. \begin{cases} x < -4 \\ 3x + 2y \leq -2 \end{cases}$$

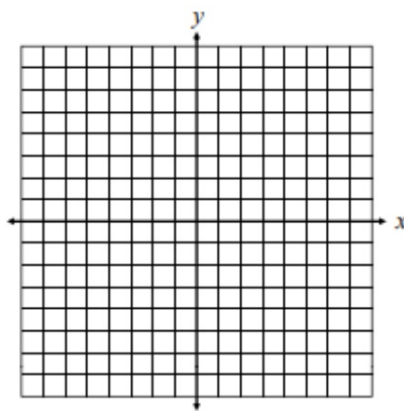
$$-3x \quad -3x$$

$$\frac{2y \leq -3x - 2}{2} \quad \frac{-3x - 2}{2}$$

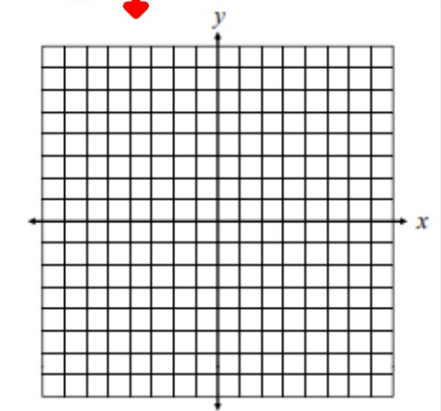
$$y \leq -\frac{3}{2}x - 1$$



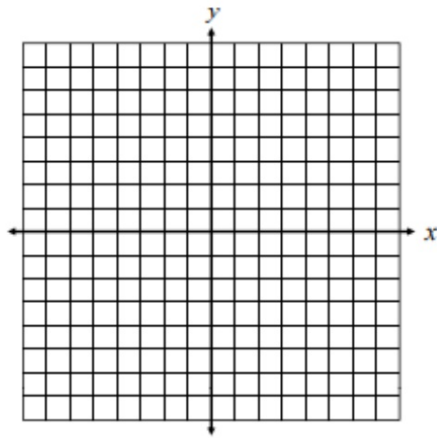
$$5. \begin{cases} 4x - 5y \geq -35 \\ y > -x - 2 \end{cases}$$



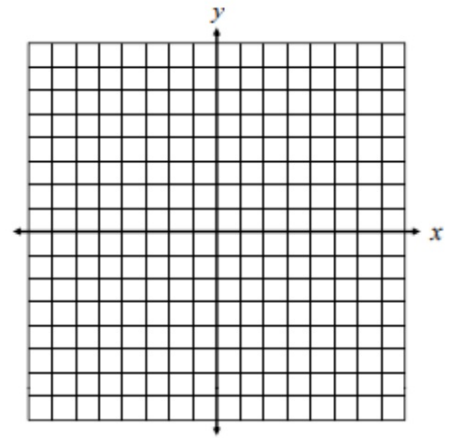
$$6. \begin{cases} 6x + 4y > 12 \\ 3x - 4y > 8 \end{cases}$$



$$7. \begin{cases} y < -5x + 6 \\ y \geq 2x - 1 \end{cases}$$

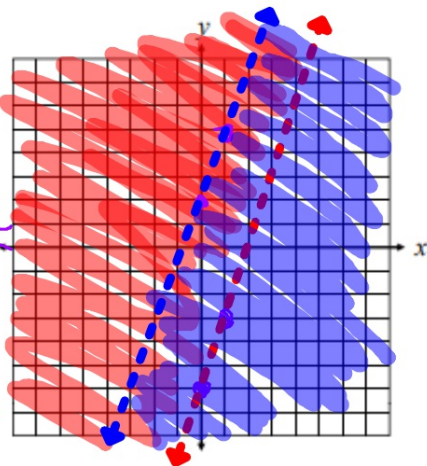


$$8. \begin{cases} 8y > -10x + 24 \\ y \leq 2 \end{cases}$$

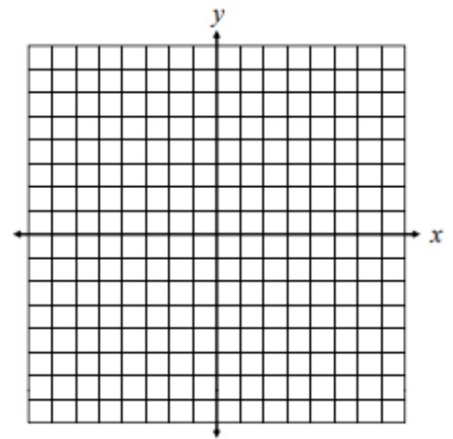


$$9. \begin{cases} 3x - y < 6 \\ 3x - y > -2 \end{cases}$$

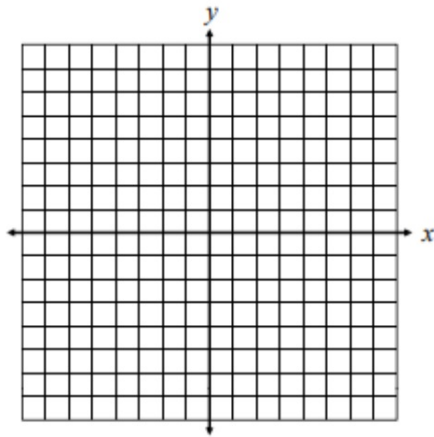
$$\begin{aligned} & -3x \quad -3x \\ \hline y & > -3x + 2 \\ \hline & -1 \quad -1 \\ y & < 3x + 1 \end{aligned}$$



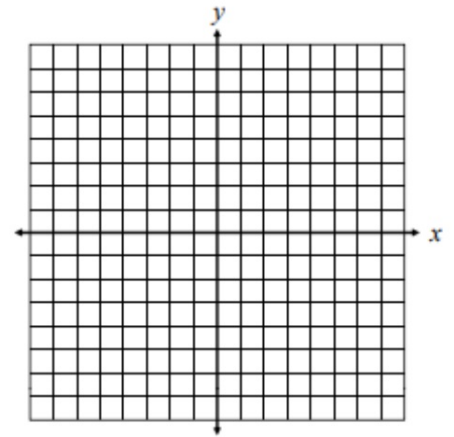
$$10. \begin{cases} 5x + 2y \geq 4 \\ x + 4y < -8 \end{cases}$$



$$11. \begin{cases} 7x + 4y \geq -32 \\ x - y < -3 \end{cases}$$



$$12. \begin{cases} x - 2y \geq 12 \\ x + 2y \leq -8 \end{cases}$$



**Application:** Sarah's Pet Store never has more than a combined total of 16 cats and dogs. She also never has more than 9 cats. Write a system of inequalities and graph to show the possible number of cats and dogs in her store.

$x = \text{cats}$

$y = \text{dogs}$

$$\begin{aligned} x + y &\leq 16 & y &\leq -x + 16 \\ -x & & -x & \\ x &\leq 9 & & \end{aligned}$$

