Name: _____ Date: _____

10.3 NOTES: Solving Systems of Linear Inequalities by Graphing   Algebra I

Exercise 1: Consider the following system of linear inequalities and all of the given ordered pairs.

$$y < 2x + 1 \text{ and } x + y \geq 10$$

$$(8, 6), \ (3, 7), \ (1, 10), \ (-3, 7), \ (5, 5), \ (3, -7)$$

a. Circle all the ordered pairs (x, y) that are solutions to the inequality $y < 2x + 1$.

b. Underline all the ordered pairs (x, y) that are solutions to the inequality $x + y \geq 10$.

c. List the ordered pair(s) (x, y) that are solutions to the system (**both** $y < 2x + 1$ **and** $x + y \geq 10$).

d. Graph both $y < 2x + 1$ and $x + y \geq 10$, and all of the ordered pairs on the coordinate plane. Highlight the points that lie in BOTH solution sets.

Remember, when graphing an inequality…

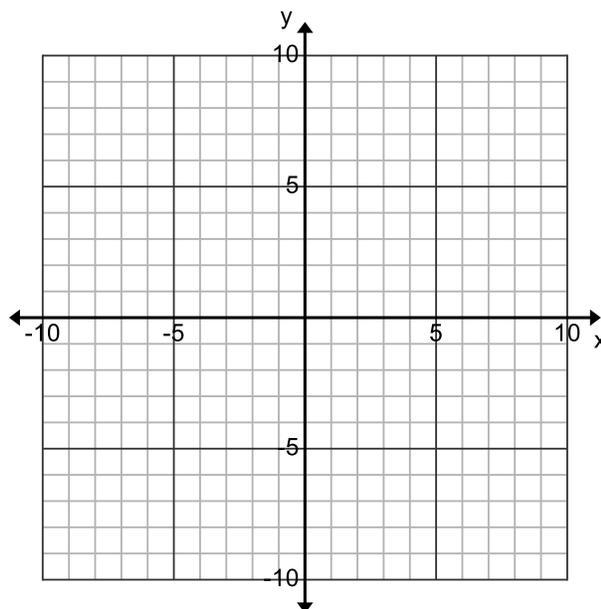|	
$y < mx + b$	dashed line, shade below the line
$y \leq mx + b$	solid line, shade below the line
$y > mx + b$	dashed line, shade above the line
$y \geq mx + b$	solid line, shade above the line
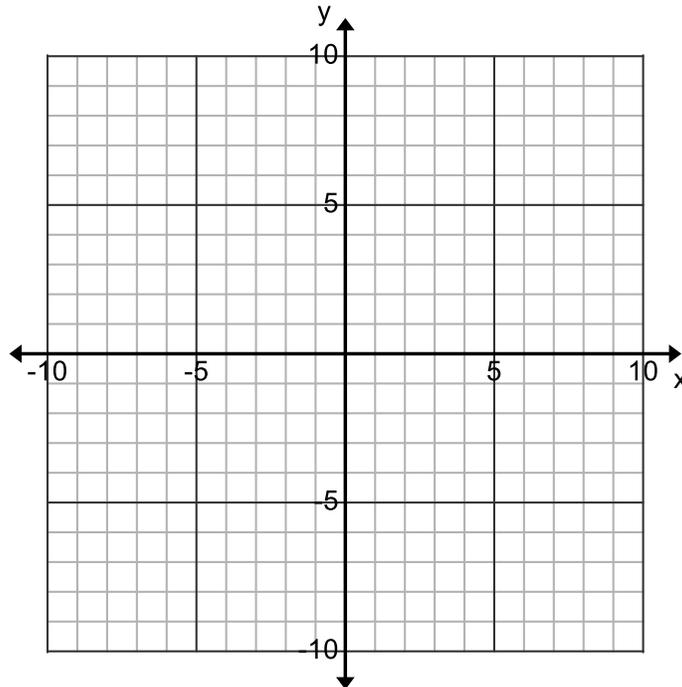
The soltions to a system of inequalities are ordered pairs that are solutions to _____ inequalities, and can be found where the shading _____.

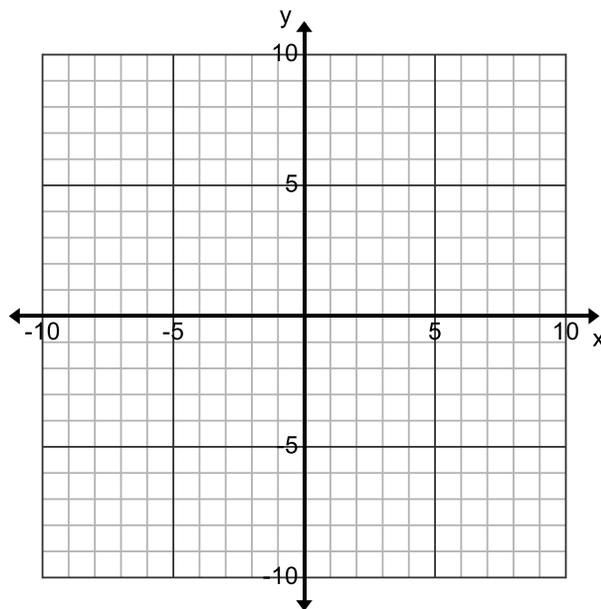**Exercise 2: Solve the following systems of inequalities by graphing.**

1. $y - 3 \leq -2x$ and $x - 6 < 2y$

** Label the solution set **S**. **

** After graphing, pick a point where
the shading overlaps and check it. **

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

Exercise 3: Solve the following word problem by graphing a system of inequalities.

   Suppose you work two jobs each week. You bag groceries at Price chopper for $8 per hour and you baby sit your neighbor's son for $5 per hour. You need to earn at least $110 dollars per week to cover your expenses, but the most you can work is 20 hours. Create and graph a system of inequalities to determine how many hours you could work bagging groceries and how many hours you could work babysitting.
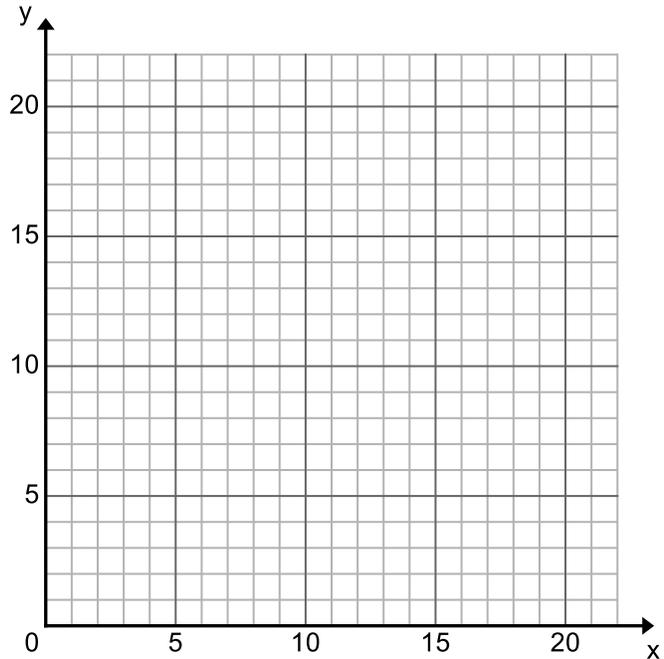
a. Provide one solution to your system and describe what it means. _____

   _____

   _____

b. Is it possible for you to earn enough money by just babysitting? _____

   How many hours would you have to babysit to earn $110? _____

   What point on the graph represents this situation? _____

c. Provide one solution that would result in you earning exactly $110. _____

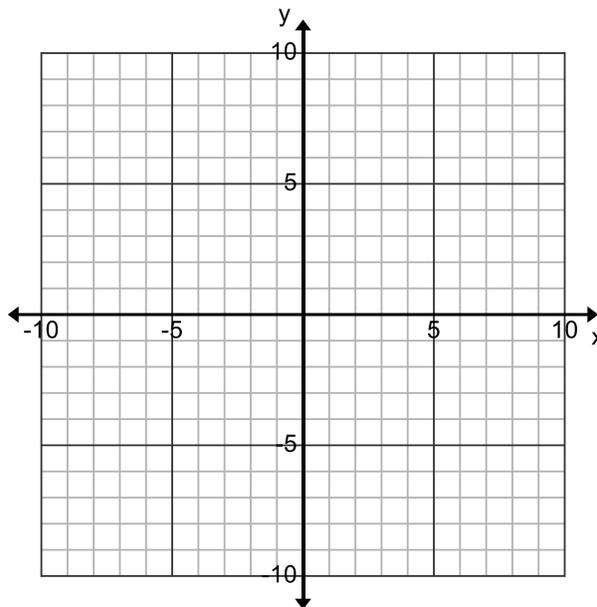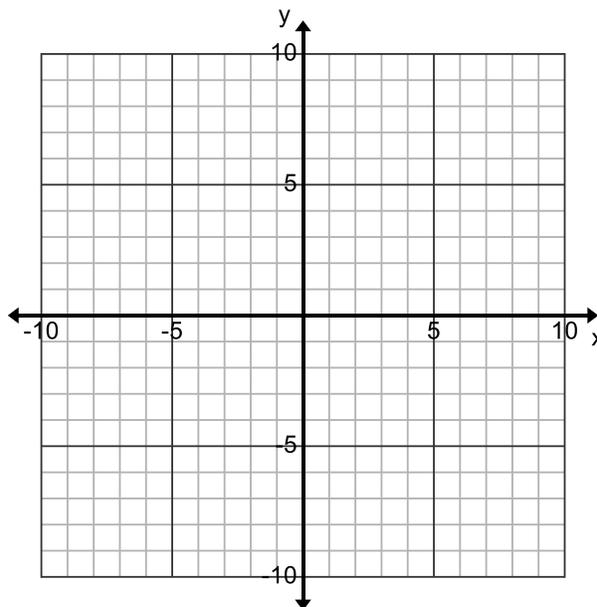Solve the following systems of inequalities by graphing.

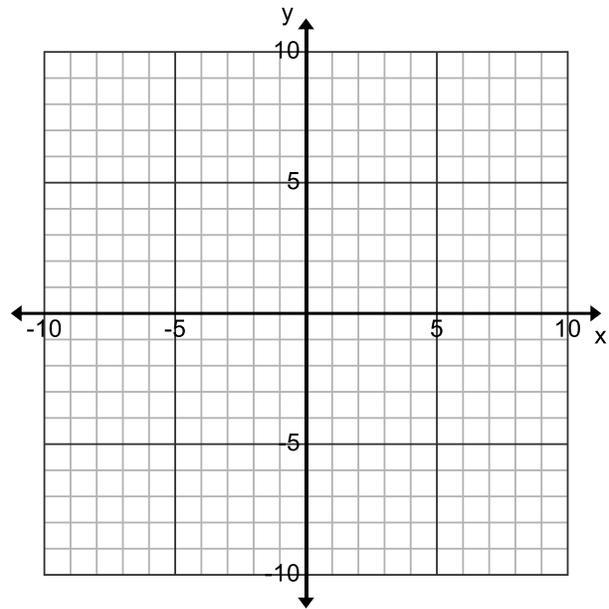1. $y \geq 2x + 1$ and $y < -x + 4$

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

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

4. For a hiking trip, you are making a mix of x ounces of peanuts and y ounces of chocolate pieces. You want the mix to have less than 70 grams of fat and weigh less than 8 ounces. An ounce of peanuts has 14 grams of fat, and an ounce of chocolate pieces has 7 grams of fat. Write and graph a system of inequalities that models the situation. State one solution to the system, and describe what it means in the context of the problem.