

Name: \_\_\_\_\_

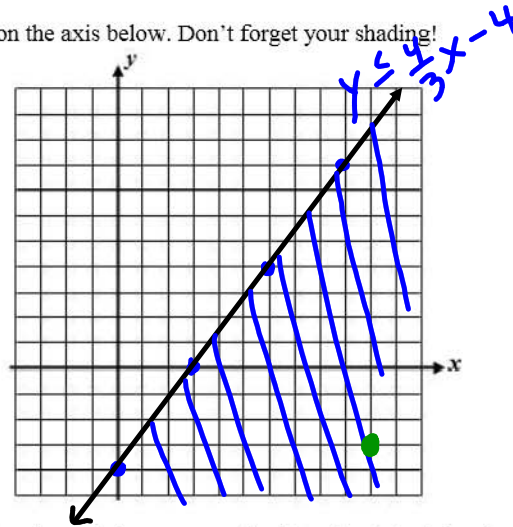
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**SYSTEMS OF INEQUALITIES!**

We can have **systems of inequalities** as well as **systems of equations (equalities)**. The definition of solving a system still holds: we have to find all points that make all inequalities true.

**Do Now:** Graph the following linear inequality on the axis below. Don't forget your shading!

①  $y \leq \frac{4}{3}x - 4$   
 y-int: -4  
 slope:  $\frac{4}{3}$



**Exercise #1:** Consider the system of inequalities shown below. Determine if each of the following points is a solution or not to the system. Show work that justifies your answers.

(a)  $(3, 8)$       (b)  $(5, 9)$

$y > -x + 10$        $y \geq 3x - 5$

$8 > -(3) + 10$        $8 \geq 3(3) - 5$

$8 > 7$  😊       $8 \geq 9 - 5$

$8 \geq 4$  😊

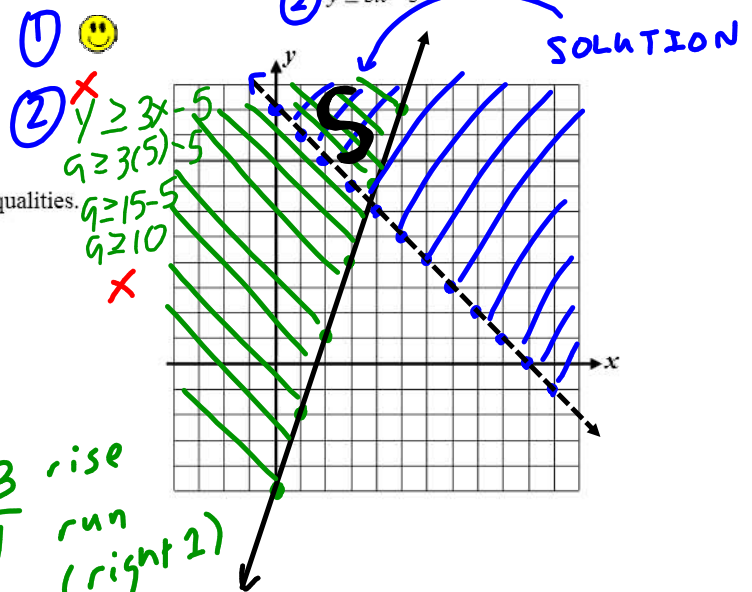
①  $x + y > 10 \rightarrow y > -x + 10$

②  $y \geq 3x - 5$

DASHED LINE

$y > -x + 10$   
 $y \geq 3x - 5$

slope  $\frac{3}{1}$  rise run (right 1)

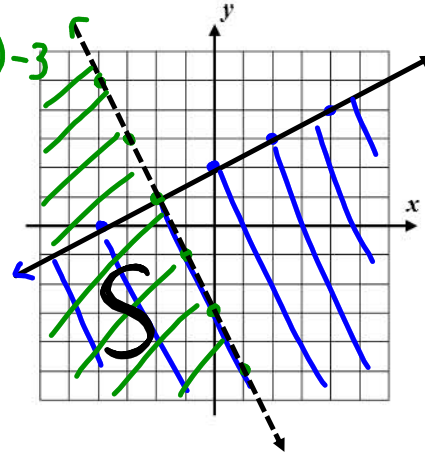


**Exercise #2:** On the grid shown below, graph the solution to the system of inequalities shown below. State a point that lies in the solution set and one that doesn't.

$$\begin{array}{l}
 \text{Blue: } y \leq \frac{1}{2}x + 2 \\
 \text{Green: } y < -2x - 3
 \end{array}$$

$$\begin{array}{l}
 -2 \leq \frac{1}{2}(-3) + 2 \\
 -2 \leq -1.5 + 2 \\
 -2 \leq .5 \quad \text{😊}
 \end{array}$$

$$\begin{array}{l}
 -2 < -2(-3) - 3 \\
 -2 < 6 - 3 \\
 -2 < 3 \quad \text{😊}
 \end{array}$$



Point in Solution Set:

$$(-3, -2)$$

Point Not in Solution Set:

$$\begin{array}{l}
 (1, 3) \\
 (0, 0)
 \end{array}$$

**Exercise #3:** Which of the following points is a solution to the system of inequalities shown below? Show the work that leads to your answer.

(1)  $(3, -6)$

(3)  $(-2, 10)$

$$y \leq -4x + 2$$

$$y > \frac{x}{2} + 7$$

(2)  $(0, 2)$

(4)  $(4, 10)$

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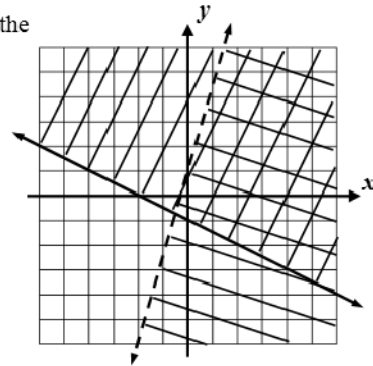
**SOLVING SYSTEMS OF INEQUALITIES  
HOMEWORK**

1. Which of the following points is a solution to the system of inequalities shown below?

- |            |             |                  |
|------------|-------------|------------------|
| (1) (3, 5) | (3) (1, -2) | $y > x + 1$      |
| (2) (1, 3) | (4) (2, 3)  | $y \leq -2x + 7$ |

2. A system of inequalities is shown graphed below. Which of the following points lies in the solution set of this system?

- |             |             |
|-------------|-------------|
| (1) (-1, 2) | (3) (2, -4) |
| (2) (1, 5)  | (4) (4, 2)  |



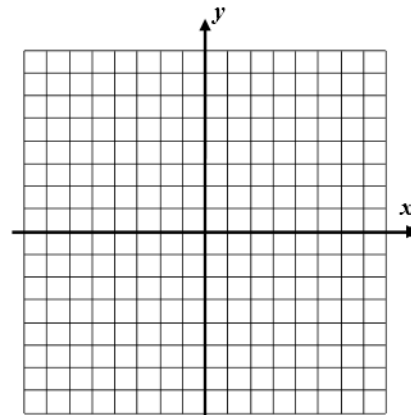
3. Consider the system of inequalities shown below.

$$y > \frac{2}{3}x - 2$$

$$y \leq -x + 6$$

(a) Is the origin, (0, 0), part of the solution set of the system?  
Determine without first graphing.

(b) Graph the solution to the system of inequalities. Then, state one point that lies in the set and one that doesn't.



One Point That Lies in the Solution:

One Point that Does Not Lie in the Solution

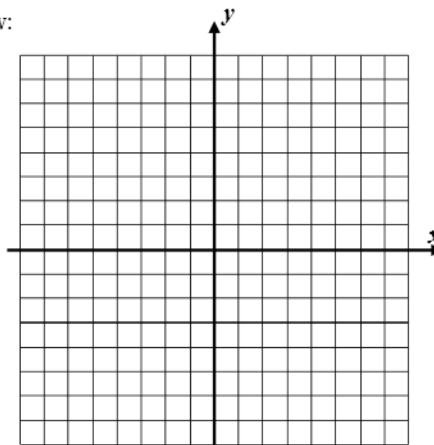
4. Sketch the solution to the system of inequalities shown below:

$$y + 2x < 6$$

$$x \leq 2$$

**try your best on this one!**

State a point that lies in the solution set:



**REASONING**

5. Consider the system of inequalities shown below:

$$y \geq x + 2$$

$$y \leq x - 3$$

(a) Graph the system solution to the system on the grid.

(b) Why can you **not** state a point in the solution set?

