



Now that we have practiced solving and graphing linear inequalities, it is time to learn to solve systems of these inequalities. The basic idea of solving a system of inequalities is the same as solving a system of linear equations by graphing.

### Skill 11: Solving Systems of Linear Inequalities

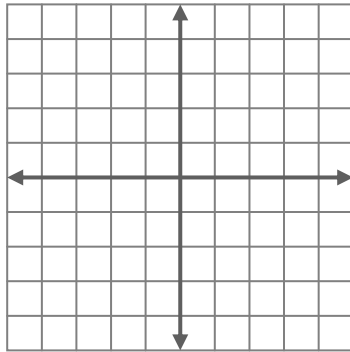
To solve a system of linear inequalities by graphing:

1. Graph each inequality separately on the same grid. (Solve each inequality for  $y$  first, if necessary.) Try to use two different shading techniques, so you can tell them apart.
2. Locate the region that has both kinds of shading. Any point in this overlapping area will solve both inequalities.
3. Substitute the coordinates of a possible solution point into the original inequalities to verify that it satisfies both. It is best not to choose a point that is on either line.

Solve each system of inequalities by graphing. Then name one point in the shaded region (truth set) and check it in both equations to see that it does work.

1.  $y \geq 2x + 1$

$y \leq -x + 1$

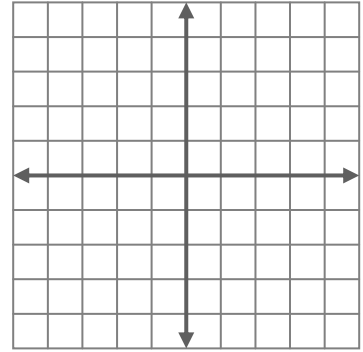


Point: \_\_\_\_\_

Check:

2.  $y > \frac{1}{2}x - 2$

$y \geq -\frac{3}{4}x + 1$

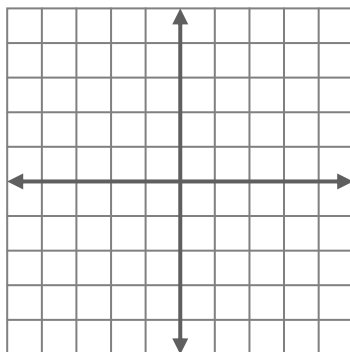


Point: \_\_\_\_\_

Check:

3.  $y < x - 3$

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

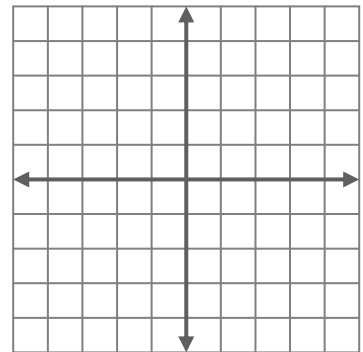


Point: \_\_\_\_\_

Check:

4.  $y \geq -2$

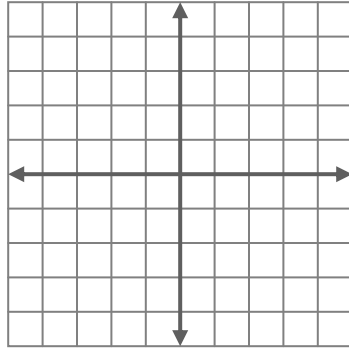
$y - x < 1$



Point: \_\_\_\_\_

Check:

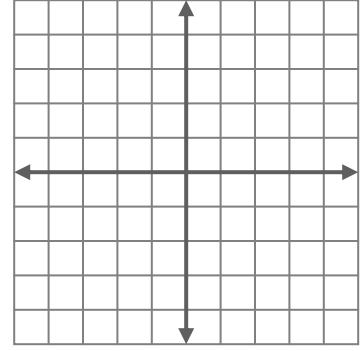
5.  $x < 1$   
 $x > -4$



Point: \_\_\_\_\_

Check:

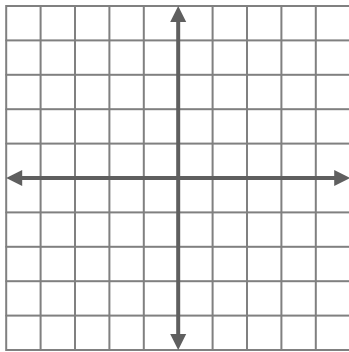
6.  $y \geq 3x$   
 $3y < 5x$



Point: \_\_\_\_\_

Check:

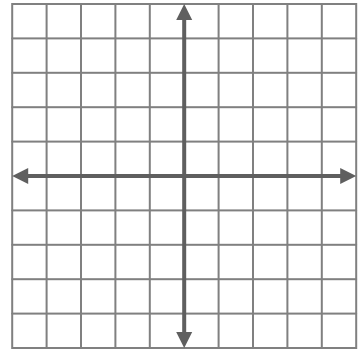
7.  $y - x < 1$   
 $y - x > 3$



Point: \_\_\_\_\_

Check:

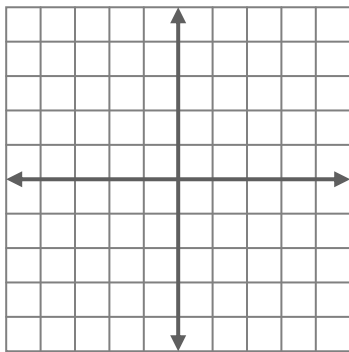
8.  $2x + y \leq 4$   
 $3x - y \geq 6$



Point: \_\_\_\_\_

Check:

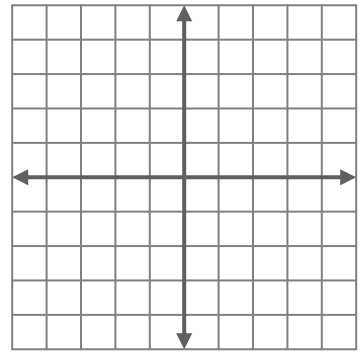
9.  $y > 2$   
 $x \leq -1$



Point: \_\_\_\_\_

Check:

10.  $2x - 3y \leq 0$   
 $2x - 3y \geq -9$



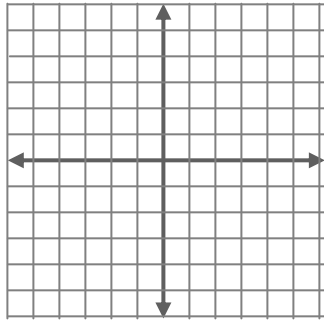
Point: \_\_\_\_\_

Check:



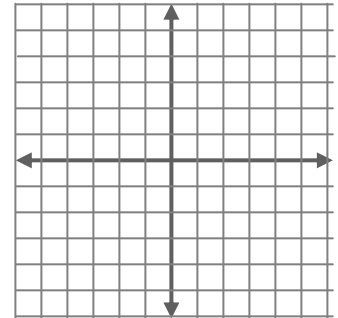
**S**olve each system of inequalities by graphing. **Then name one point in the shaded region and check it in both inequalities** to verify that it does work.

1.  $x > 5$   
 $y \leq 4$



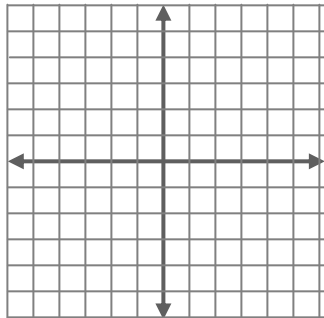
Check:

2.  $y > 3$   
 $y > -x + 4$



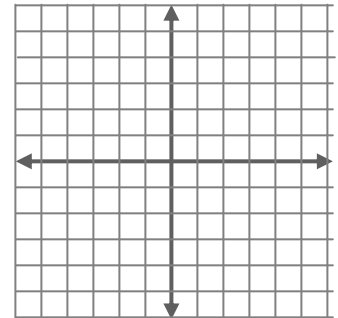
Check:

3.  $x \geq 2$   
 $y + x \leq 5$



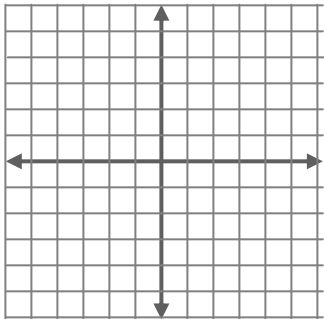
Check:

4.  $2y + x < 6$   
 $3x - y > 4$



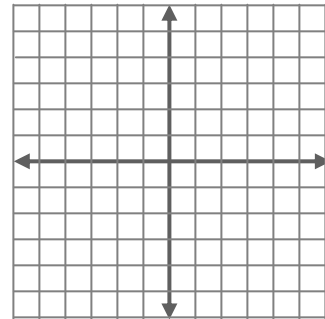
Check:

5.  $3x - 4y < 4$   
 $x + 2y \leq 8$



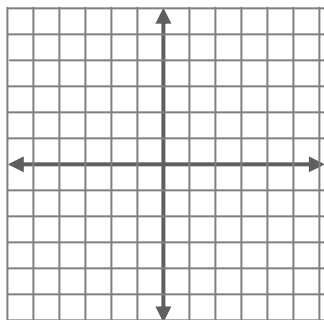
Check:

6.  $5y \geq 3x + 10$   
 $2y \leq 4x - 10$



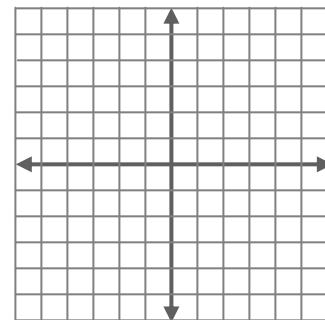
Check:

7.  $y + 2 \leq x$   
 $2y - 3 > 2x$



Check:

8.  $x + y > 4$   
 $-2x + 3y < -12$



Check: