

Graphing Systems of Linear Inequalities

Steps in Graphing Linear Inequalities

Before you begin, make sure both inequalities are in slope-intercept form. If they are not, change them to this form by solving for y .

Step #1: Graph the first inequality; select a point to help determine which side to shade.

Step #2: Graph the second inequality; select a point to help determine which side to shade.

*Remember to shade in a different color or in a different direction

Step #3: Determine the solution. The solution is the **intersection of the shaded area**.

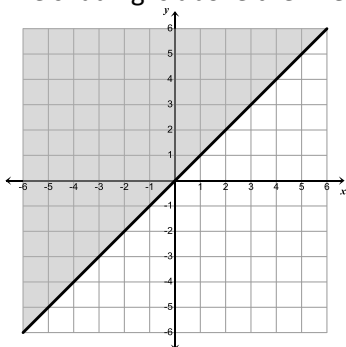
Step #4: Check a point – select a point that is in the solution and make sure it is a solution to all of the inequalities in the system.

Example

Graph the system of inequalities:
$$\begin{cases} y \geq x \\ y \geq -x + 1 \end{cases}$$

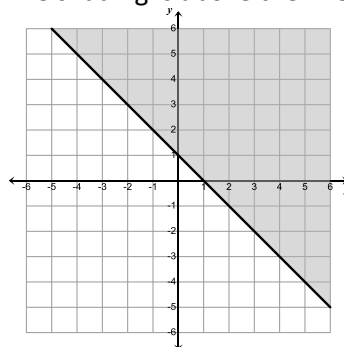
Graph the first inequality: $y \geq x$

- The line is solid because the inequality sign is $\geq$
- The shading is above the line

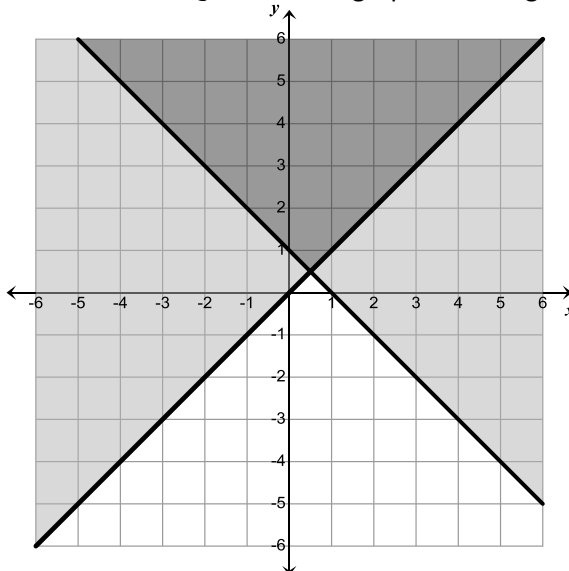


Graph the second inequality: $y \geq -x + 1$

- The line is solid because the inequality sign is $\geq$
- The shading is above the line

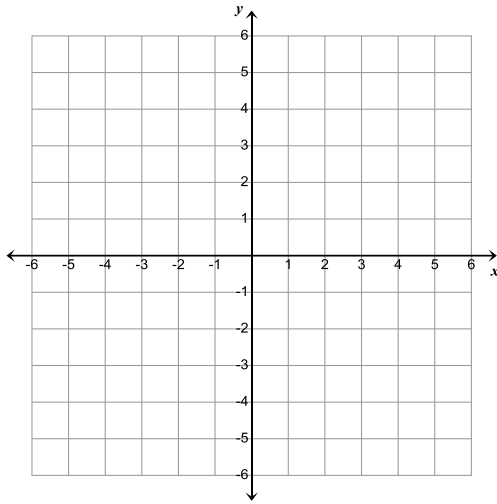


The solutions to the system are in the **overlap** of the two graphs' shading.

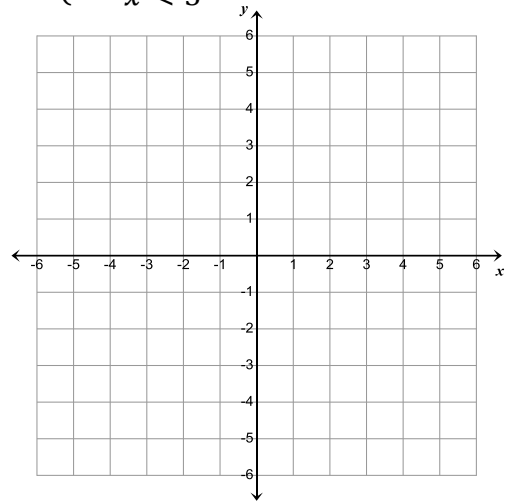


Graph the following systems of inequalities.

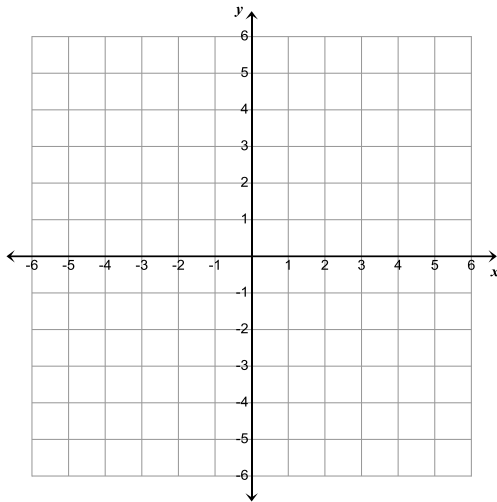
1.
$$\begin{cases} y \leq x + 2 \\ y > 2x \end{cases}$$



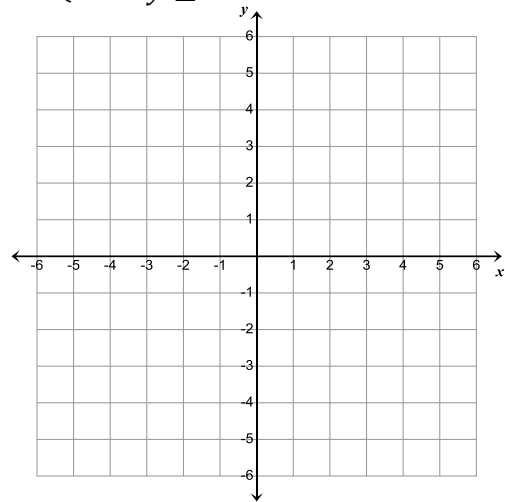
2.
$$\begin{cases} y \geq -\frac{1}{4}x - 1 \\ x < 3 \end{cases}$$



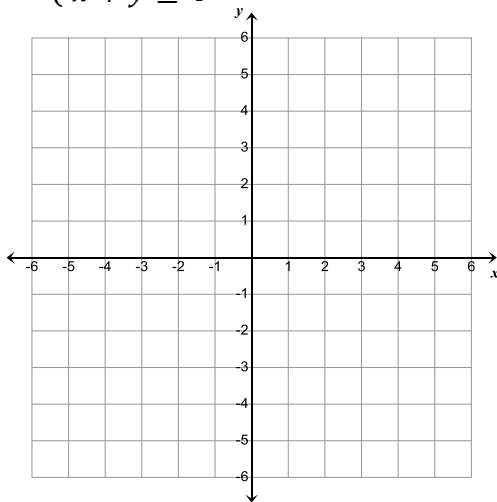
3.
$$\begin{cases} y \leq 2x + 1 \\ y < x - 1 \end{cases}$$



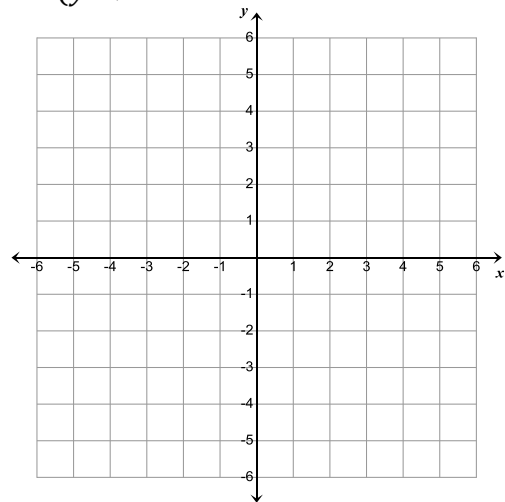
4.
$$\begin{cases} y \leq \frac{2}{3}x \\ 2x - y \geq 3 \end{cases}$$



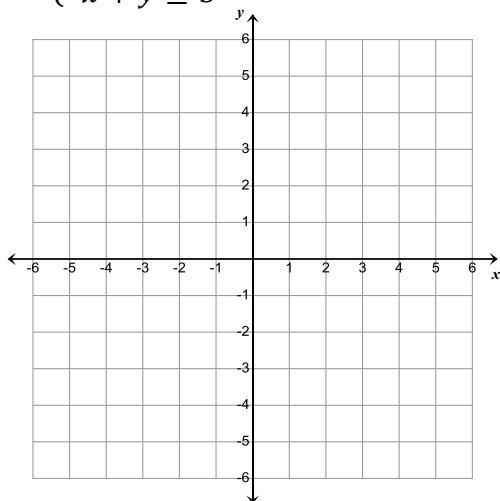
5.
$$\begin{cases} 3x + y > 6 \\ x + y \leq 4 \end{cases}$$



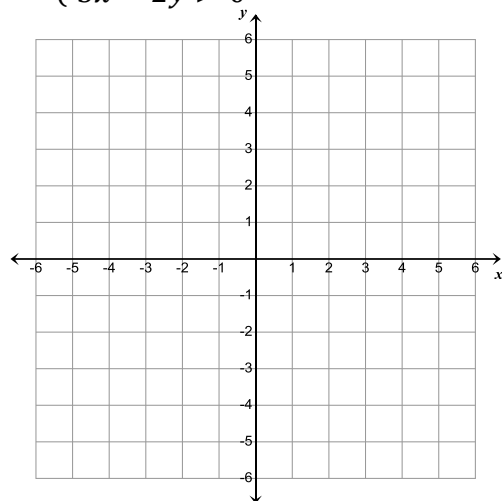
6.
$$\begin{cases} x < -1 \\ y < -2 \end{cases}$$



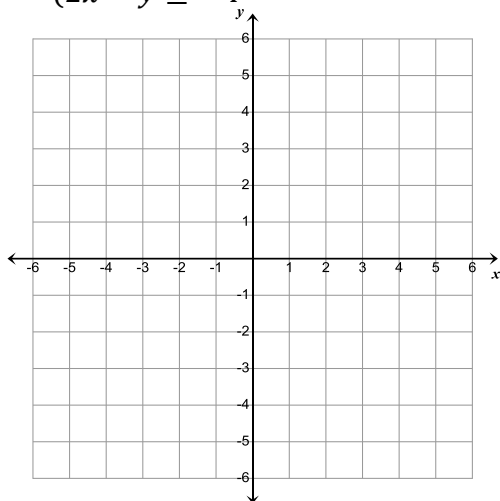
7.
$$\begin{cases} 2x - 3y \leq 3 \\ x + y \leq 5 \end{cases}$$



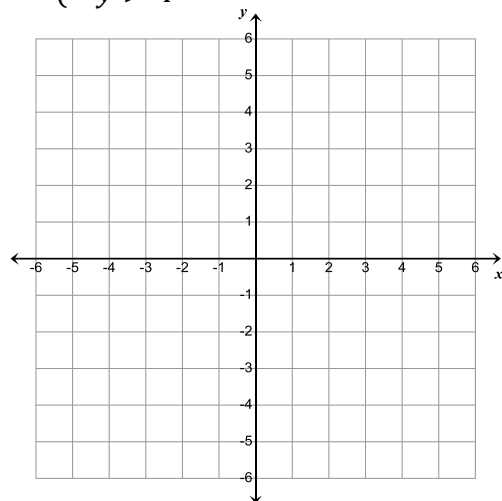
8.
$$\begin{cases} 2x + 3y < 15 \\ 3x - 2y > 0 \end{cases}$$



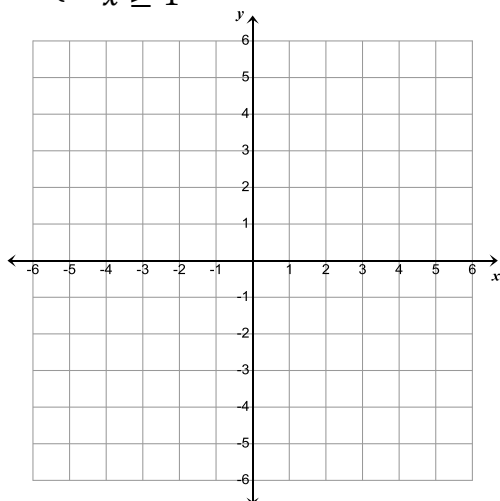
9.
$$\begin{cases} 2x - y \leq 3 \\ 2x - y \geq -4 \end{cases}$$



10.
$$\begin{cases} x + y > 0 \\ y > 4 \end{cases}$$



11.
$$\begin{cases} 3x + y < 1 \\ x \geq 1 \end{cases}$$



12.
$$\begin{cases} y \geq x \\ y > 0 \end{cases}$$

