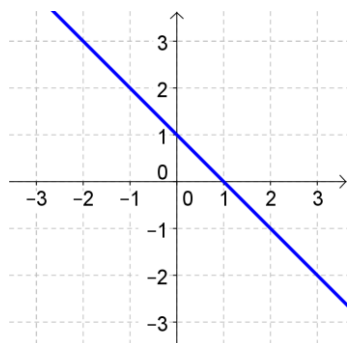
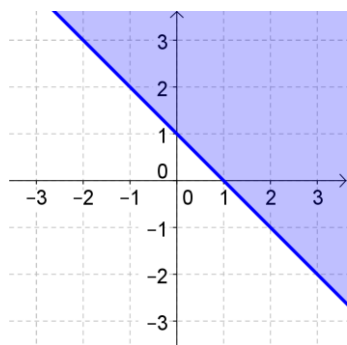


Linear Inequalities in Two Variables

Solutions to the linear equation $y = -x + 1$ are points on the line shown below:



Solutions to the **linear inequality** $y \geq -x + 1$ include all the points **on and above** the line:



How to Graph Linear Inequalities in Two Variables

1. Solve the inequality for y .
2. Graph the related equation (replacing inequality with an equals sign).

Use _____ if have $<$ or $>$.

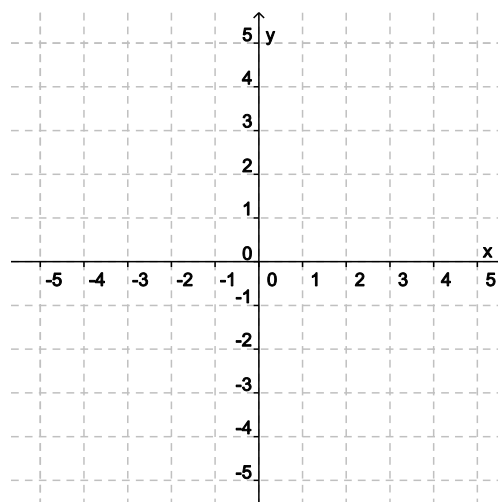
Use _____ if have \leq or \geq .

3. If you have " $y >$ " or " $y \geq$ ", then shade half-plane _____ the line.

If you have " $y <$ " or " $y \leq$ ", then shade half-plane _____ the line.

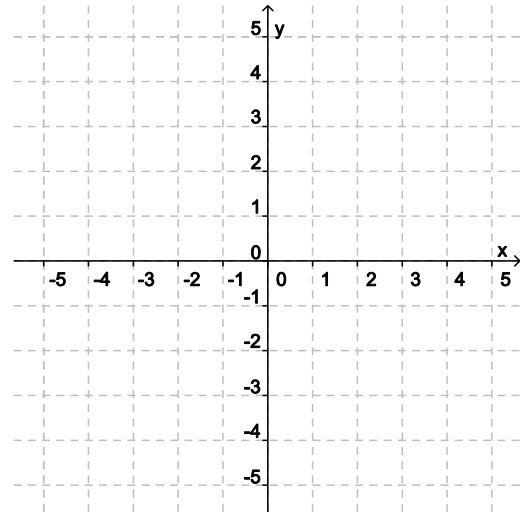
Ex 1.

Graph: $3x - 2y \geq 6$.

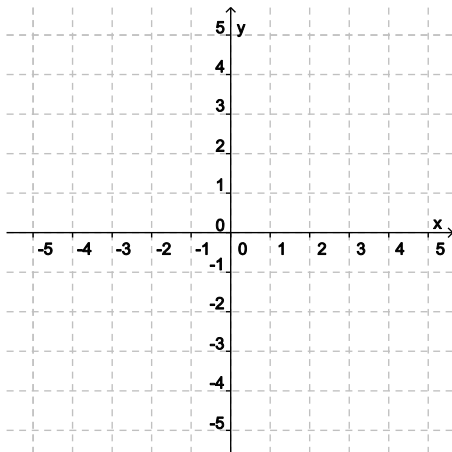


Ex 2.

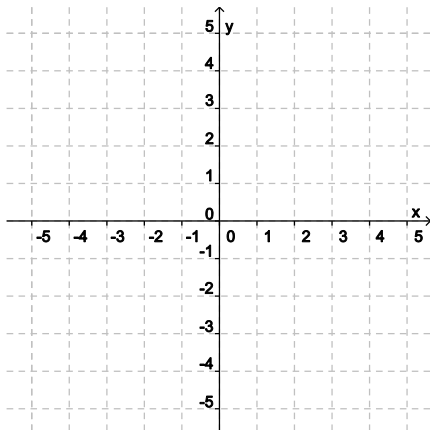
Graph: $y > -\frac{3}{2}x$.

**Ex 3.**

Graph: $y < -2$.

**Ex 4.**

Graph: $x \geq 1$.



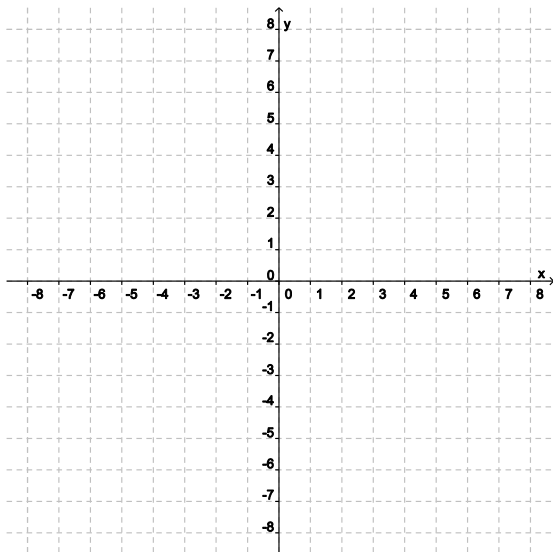
Systems of Linear Inequalities

Ex 5.

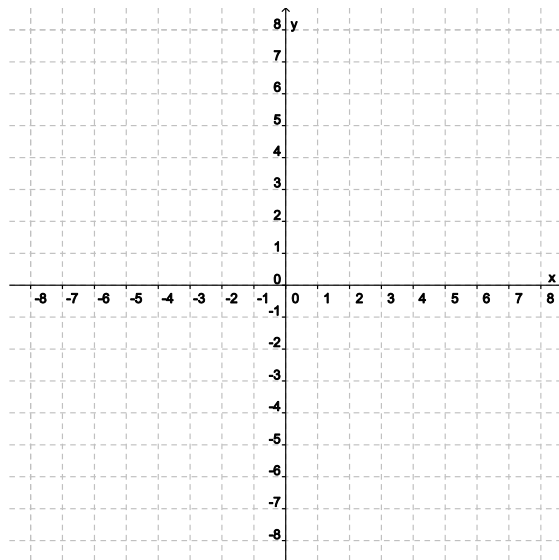
Graph the solution set of the system:

$$x - 3y < 6$$

$$2x + 3y \geq -6$$



(this one for scratch work)



(this one for final graph)

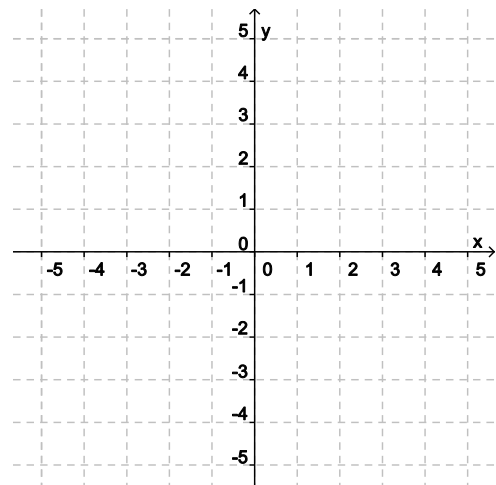
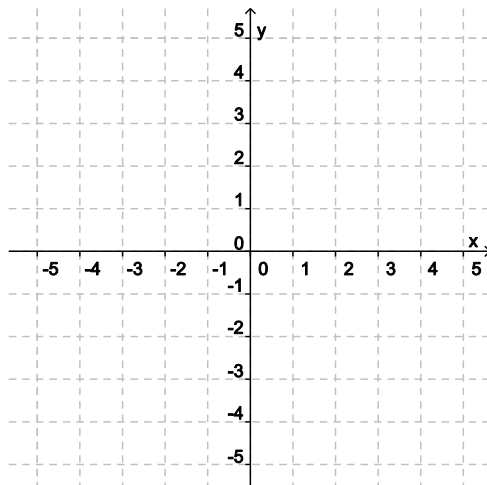
Ex 6.

Graph the solution set of the system:

$$x + y < 2$$

$$-2 \leq x < 1$$

$$y > -3$$

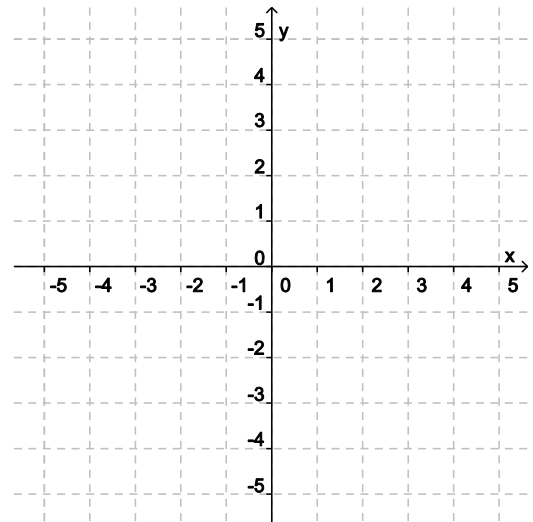


Ex 7.

Try graphing the following system. What happens?

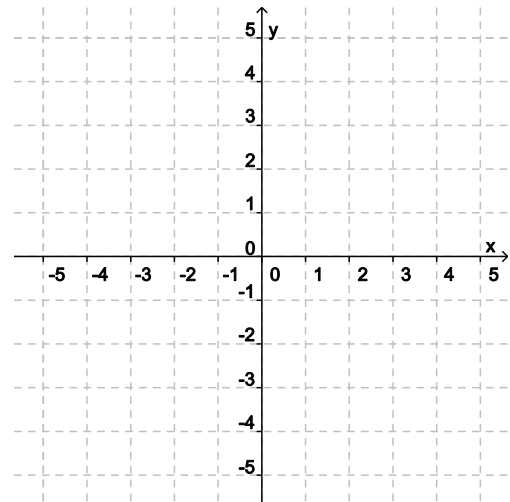
$$2x + 3y \geq 6$$

$$2x + 3y \leq 0$$

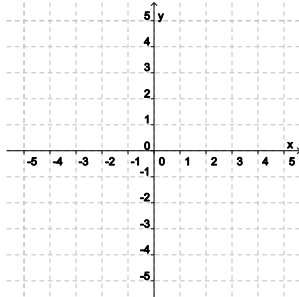


Practice

1. Graph: $2x - 4y < 8$.



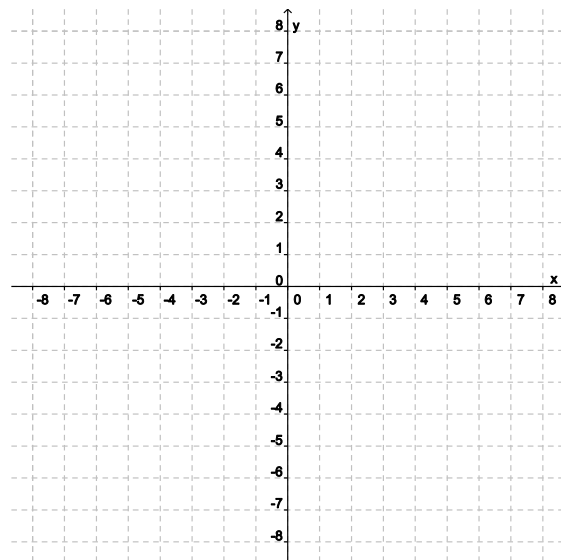
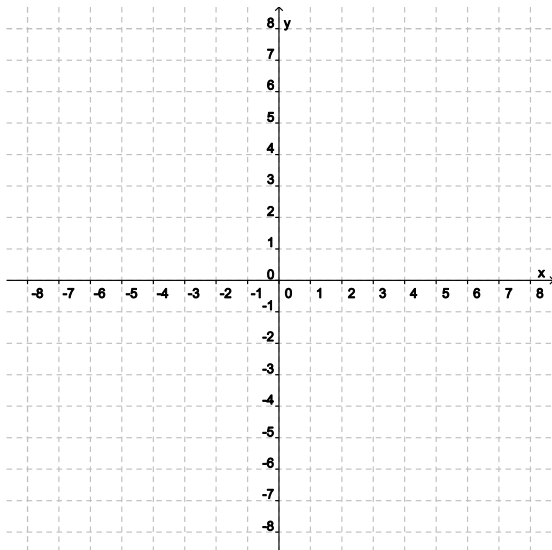
2. Graph: $x < -3$.



3. Graph the solution set of the system:

$$2x - y \leq 4$$

$$3x + 2y > -6$$

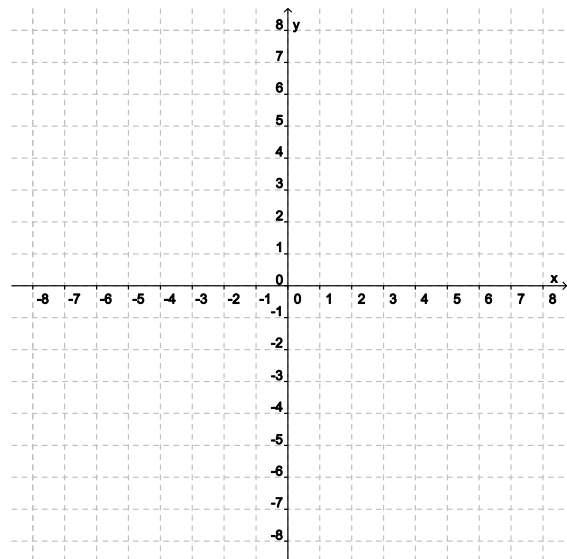
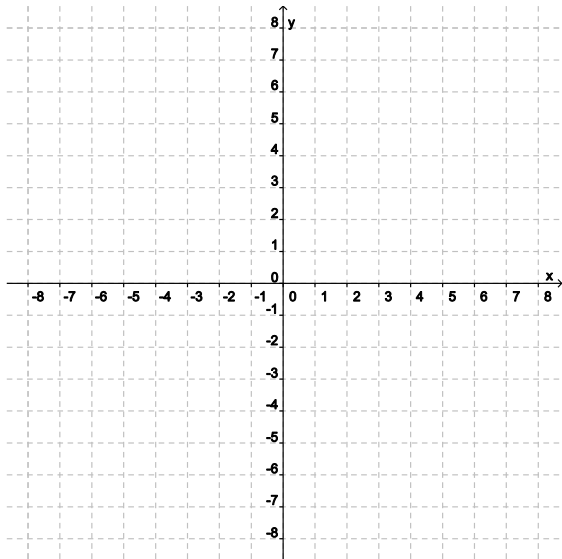


4. Graph the solution set of the system, or indicate that the system has no solution:

$$3x + y \leq 6$$

$$x \geq -2$$

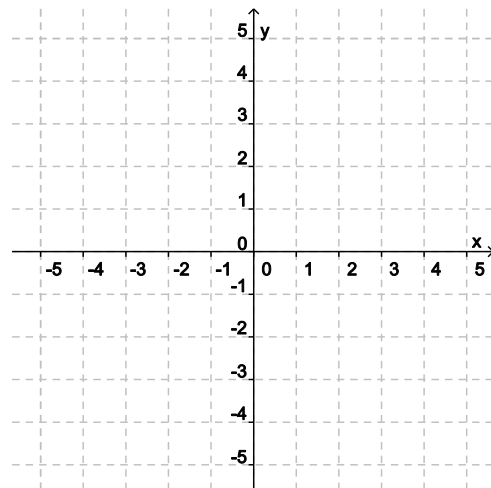
$$y \leq 4$$



5. Graph the solution set of the system, or indicate that the system has no solution:

$$x + y > 3$$

$$x + y < -2$$



Q: What goes up and never comes down?