

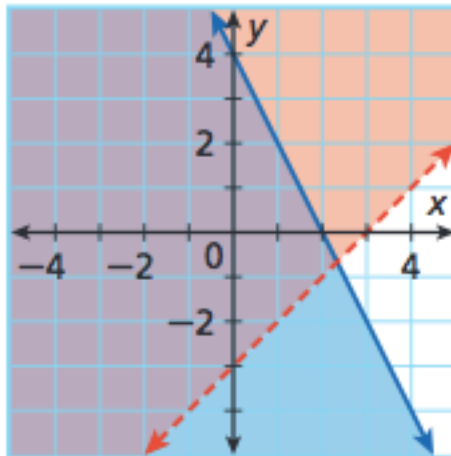
# Solving Systems of Linear Inequalities

2.6

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A ***System of Linear Inequalities*** is a set of two or more linear inequalities with the same variables.

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



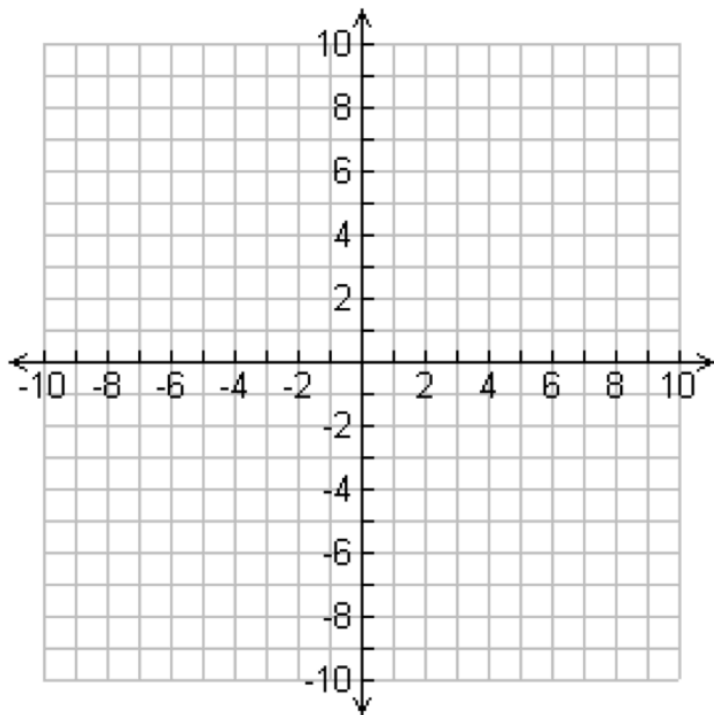
Graph the system:

Graph the  
lines

$$y \geq x - 2$$
$$y < -2x + 1$$

Shade the  
sides using a  
point of  
reference.  
(0,0)

Plug in (0,0)  
and if the  
statement is  
true, shade  
that side.

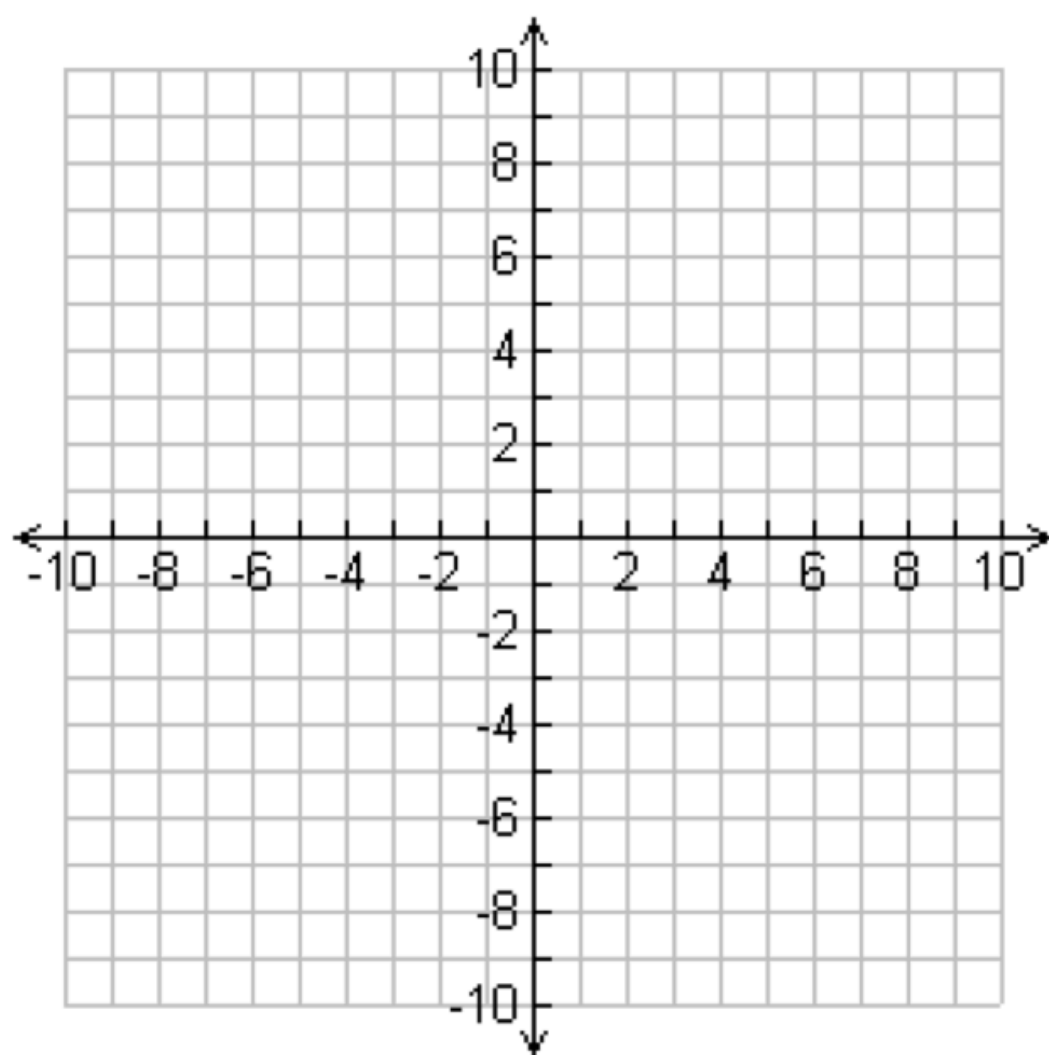


Graph the system

$$2x - y \geq 1$$

$$4y - 4x < 8$$

$$x > -3$$

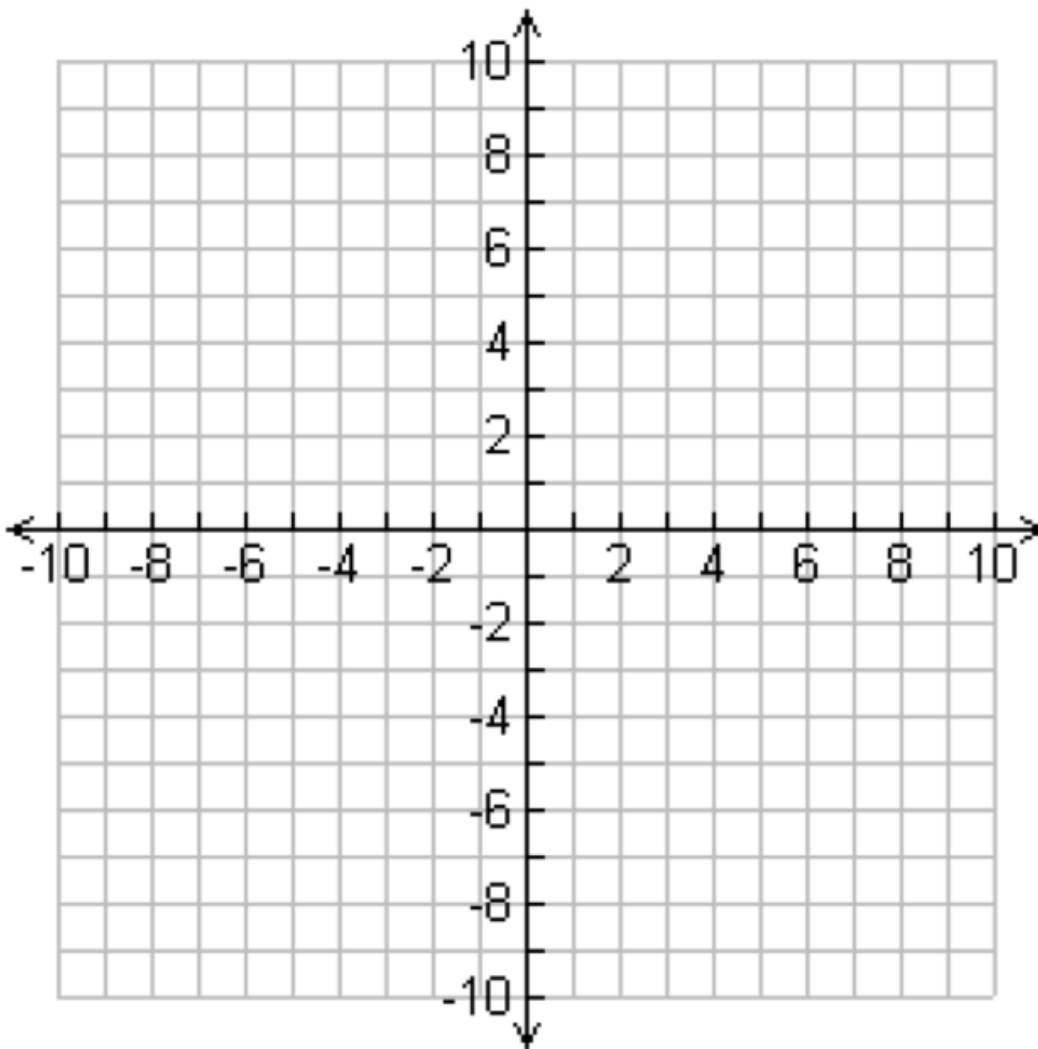


Solve the system of inequalities by graphing. Identify the vertices.

$$x \geq 0$$

$$y \geq 0$$

$$2x + y \leq 4$$



The Vertex Theorem states that the maximum or minimum value of  $f(x,y) = ax+by+c$  on a polygonal convex set occurs at a vertex of the polygonal boundary.

What is the maximum and minimum of  $F(x,y) = x+y-3$  with the system of inequalities given:

$$x \geq 0$$

$$y \geq 0$$

$$2x + y \leq 4$$

Find vertices.	$(0,0)$ , $(0,4)$ , and $(2,0)$
Plug in vertices into the given function.	$F(0,0) = 0+0-3 = -3$ $F(0,4) = 0+4-3 = 1$ $F(2,0) = 2+0-3 = -1$
Identify the max and the min.	Max=1 Min=-3

We Try:

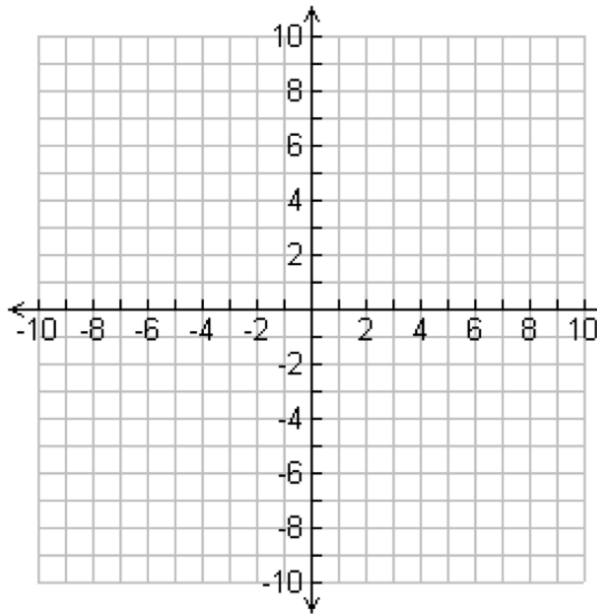
Find the maximum and minimum value for the function for the polygonal convex set determined by the given system of inequalities.

$$F(x,y)=4x+2y+7$$

$$x \geq 0$$

$$y \geq 1$$

$$x + y \leq 4$$



Find vertices.	
Plug in vertices into the given function.	
Identify the max and the min.	

You Try: