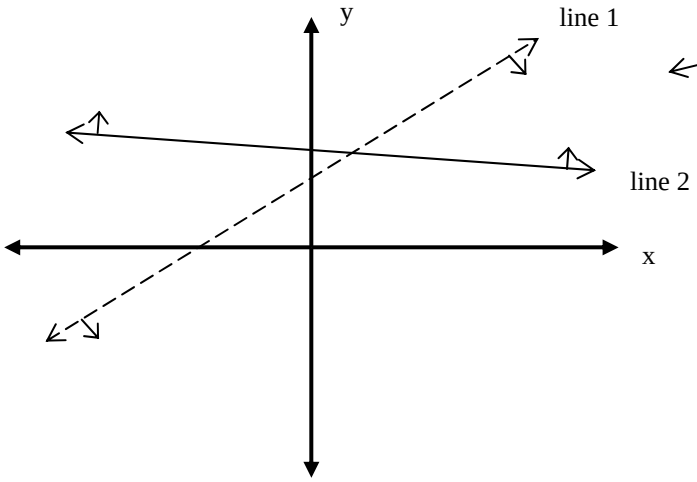
Systems of Inequalities

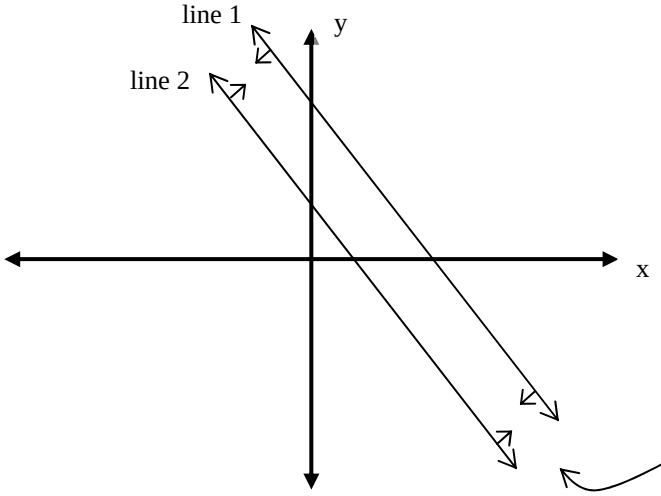
The graphing method is probably the best way to solve a system of inequalities because the solutions will fall within a region bound by lines. Generally, the solutions will be represented by shading the inequality where they exist. It is possible for a system of inequalities to have no solutions and thus no shading would occur and we would simply state that no solutions exist.

Sample



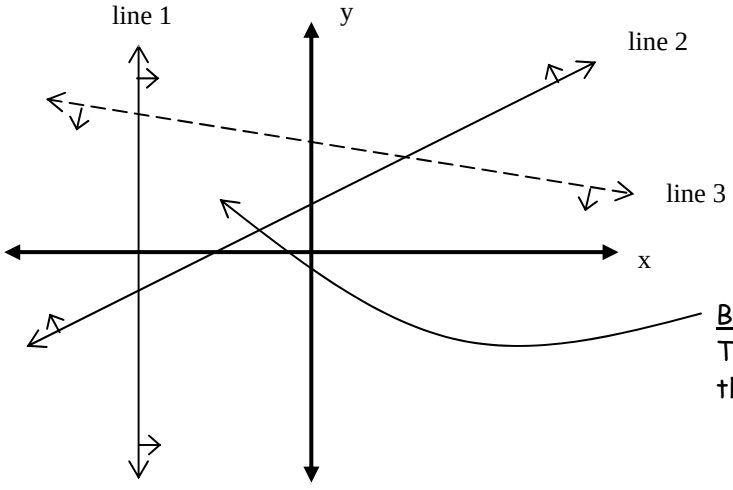
Unbound System
Solutions to this system are in the shaded zone.

Sample



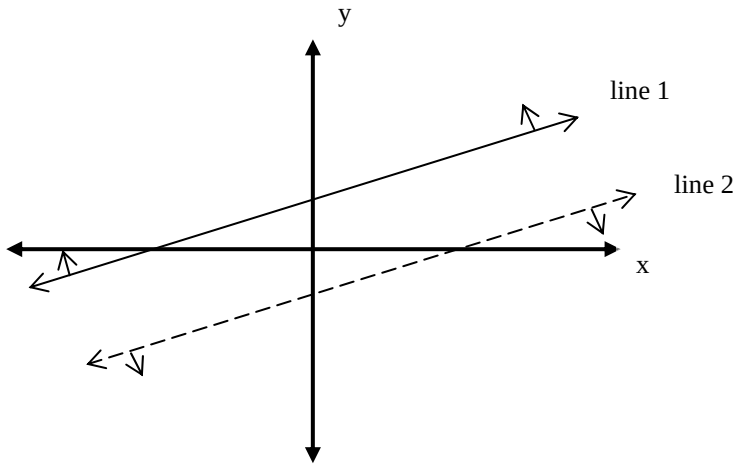
Unbound System
solutions to this system are in the shaded zone that forms a tunnel.

Sample



Bound System
The solutions to this system are in the shaded region that forms a triangle.

Sample



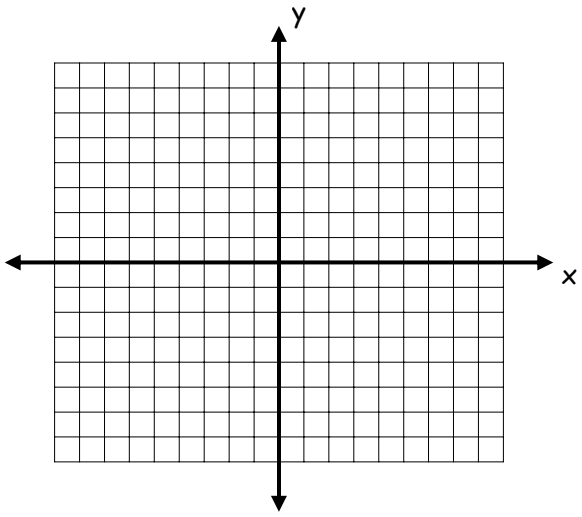
No Solutions
There is nothing in common with the individual inequalities.

How to Solve a System of Inequalities

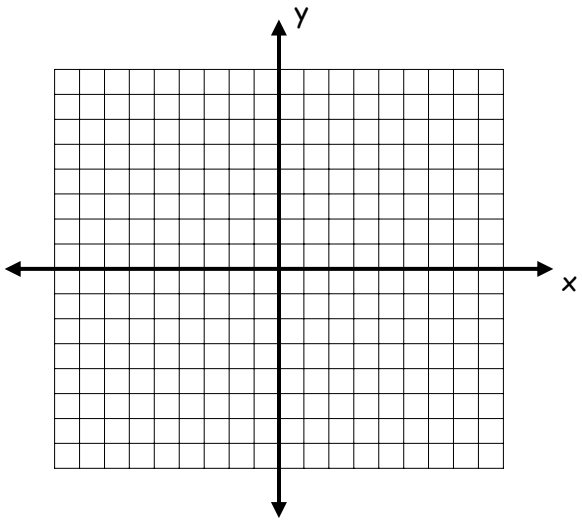
- Graph each individual inequality on the same x-y axis. (Choose the graphing methods that best suit the problem)
- Determine the region (if it exists) in which all inequalities share common solutions and shade it.
- All ordered pairs that fall within the shaded region are solutions to the system.
- Also, any ordered pairs falling on a border of the region bound with a solid line will be solutions to the system.

Directions: Sketch the graph of the system of inequalities. If the system is bound, find the coordinates of the vertices of the figure formed by the system.

Ex. 1 $x \leq 5$
$y > -3$

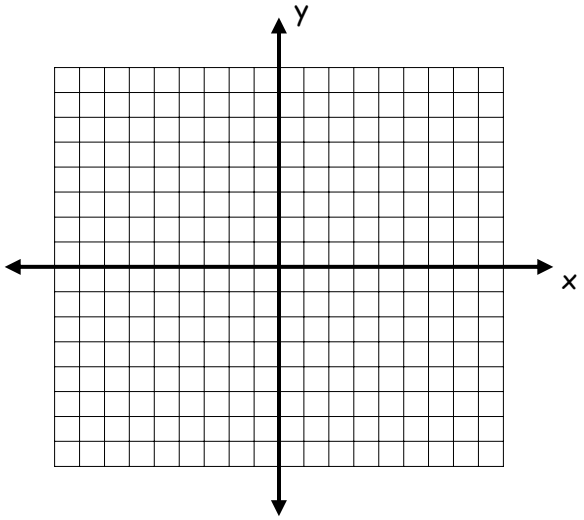


Ex. 2 $x > -4$
$x < y$
$x + 3y \geq 6$



Ex. 3 $y > \frac{2}{3}x - 4$

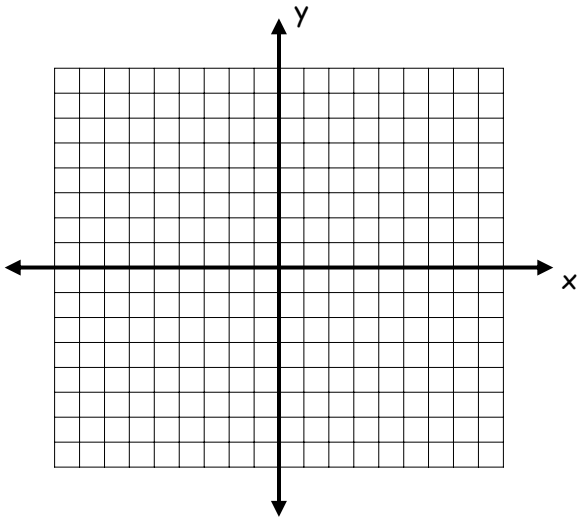
$4x - 6y > 12$



Ex. 4 $6y - 2x \leq 18$

$y > \frac{-3}{2}x - 8$

$6x - y \leq -3$



Ex. 5 $y \leq |x| - 5$

$y < 2$