Algebra 1: 7.2 Guided Notes **Name** _____ **Period** _____
Systems of Linear Inequalities

Learning Goals:
Graph systems of linear inequalities.
Determine solutions to systems of linear inequalities.

Notes

Two or more linear inequalities together form a _____

_____.

A _____ makes each inequality in the system

_____.

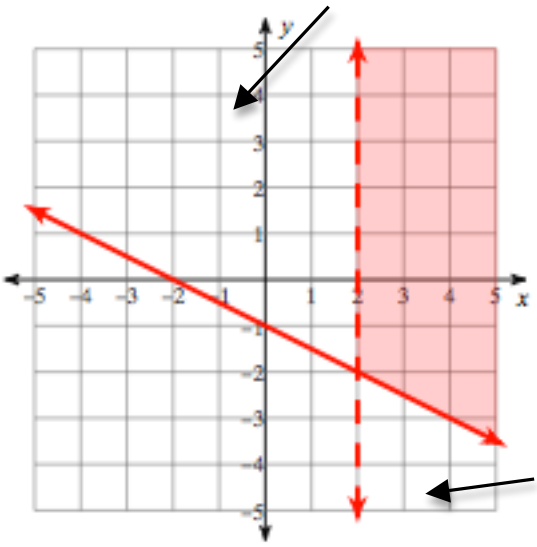
The solutions for a system of inequalities are _____ the ordered pairs in the

_____ shaded region.

If the shaded regions do _____ overlap, then there is _____ solution.

$$\begin{cases} x > 2 \\ y \geq -\frac{1}{2}x - 1 \end{cases}$$

$y \geq -\frac{1}{2}x - 1$

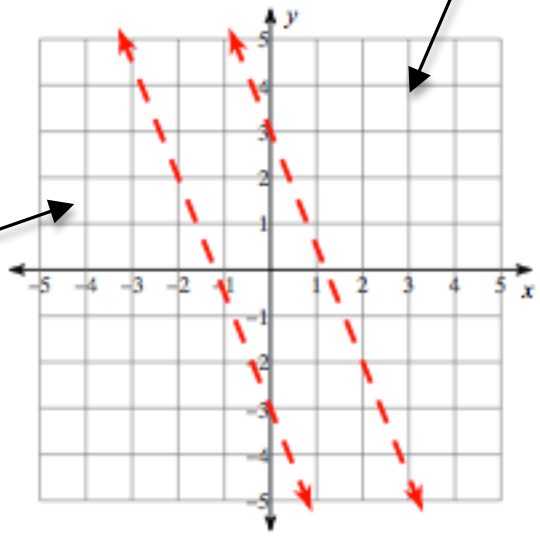


The solutions are all the ordered pairs in the overlapping shaded region and on the solid line.

$$\begin{cases} y < -\frac{5}{2}x - 3 \\ y > -\frac{5}{2}x + 3 \end{cases}$$

$y > -\frac{5}{2}x + 3$

$y < -\frac{5}{2}x - 3$



There is no solution since the shaded regions do not overlap.

Helpful Tip

Use one colored pencil to graph the first inequality and another color to graph the second inequality. The points in the region where the two colors overlap are the solutions. Algebraically, these points must satisfy both inequalities.

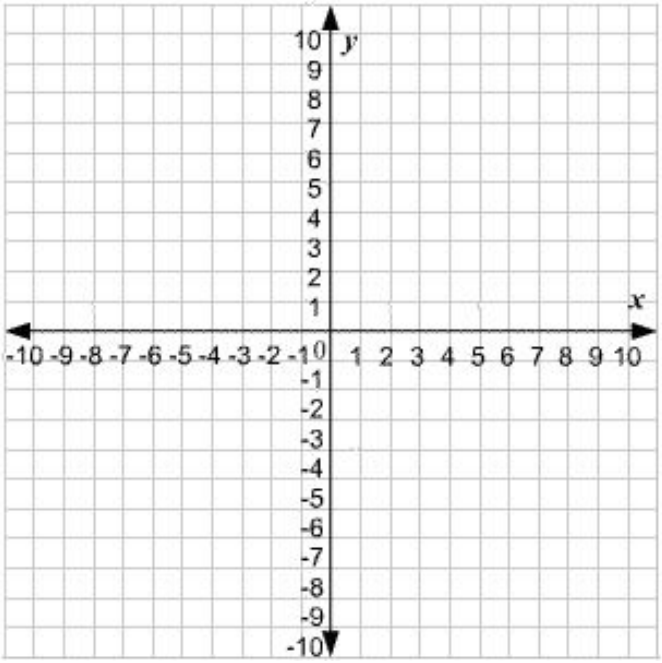
Graphing a System of Linear Inequalities

Steps:

- Write each inequality in slope-intercept form ($y = mx + b$).
- Graph each inequality on the same coordinate plane using the slope & y-intercept.
- Dashed line if < or >. Solid line if ≤ or ≥.
- Shade above if > or ≥. Shade below if < or ≤.
- Solutions are the ordered pairs (x, y) where the shaded regions OVERLAP.
- If the shaded regions, do NOT overlap, there is NO solution.

Graph the system of linear inequalities.

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



Steps:

- Choose an ordered pair (x, y) where the shaded regions overlap.
- Plug the x- and y-values into both inequalities and simplify.
- Make sure the x- and y-values result in TRUE statements for BOTH inequalities.

Check your work algebraically using a test point!