



James Madison
HIGH SCHOOL

SYSTEMS OF LINEAR INEQUALITIES

**Solving Linear Systems of *Inequalities* by
*Graphing***



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Solving Systems of Linear Inequalities

- 1. We show the solution to a system of linear inequalities by graphing them.**
 - a) This process is easier if we put the inequalities into Slope-Intercept Form, $y = mx + b$.**



Solving Systems of Linear Inequalities

2. Graph the line using the y -intercept & slope.

a) If the inequality is $<$ or $>$, make the lines dotted.

b) If the inequality is \leq or \geq , make the lines solid.



Solving Systems of Linear Inequalities

- 3. The solution also includes points not on the line, so you need to shade the region of the graph:**
- a) above the line for ' $y >$ ' or ' $y \geq$ '.**
 - b) below the line for ' $y <$ ' or ' $y \leq$ '.**



Solving Systems of Linear Inequalities

Example:

$$a: \quad 3x + 4y > -4$$

$$b: \quad x + 2y < 2$$

Put in Slope-Intercept Form:

$$a) \quad 3x + 4y > -4$$

$$4y > -3x - 4$$

$$y > -\frac{3}{4}x - 1$$

$$b) \quad x + 2y < 2$$

$$2y < -x + 2$$

$$y < -\frac{1}{2}x + 1$$



Solving Systems of Linear Inequalities

Example, continued:

$$a: y > -\frac{3}{4}x - 1 \qquad b: y < -\frac{1}{2}x + 1$$

Graph each line, make dotted or solid and shade the correct area.

a:

dotted

shade above

b:

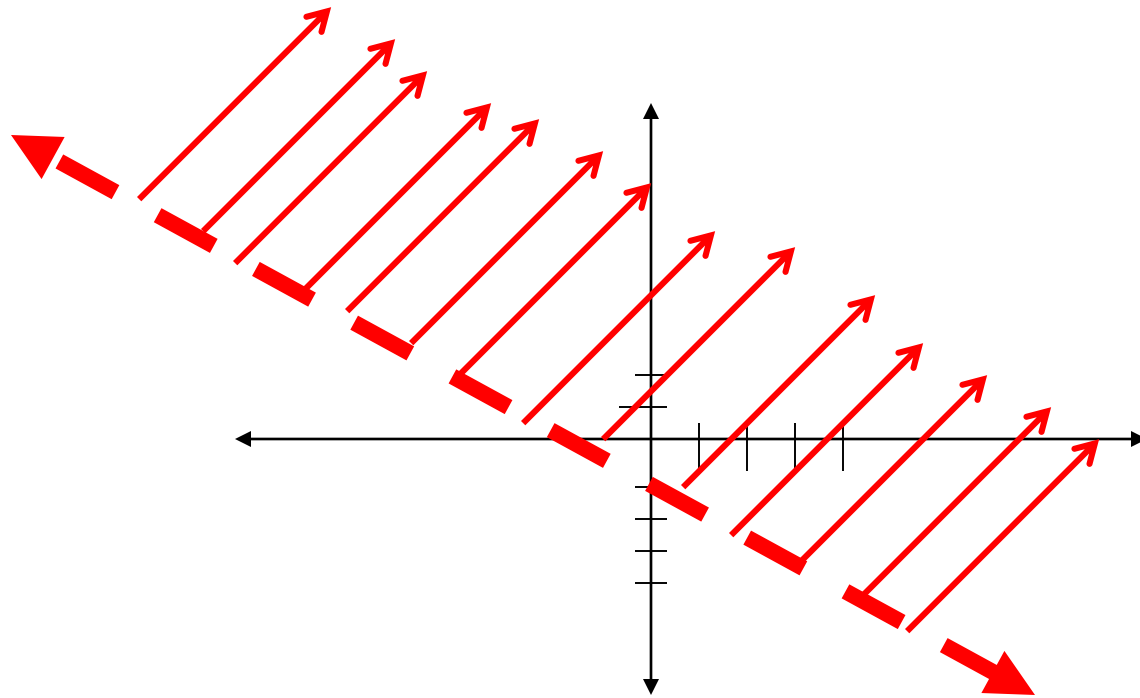
dotted

shade below

Solving Systems of Linear Inequalities

$$a: 3x + 4y > -4$$

$$a: y > -\frac{3}{4}x - 1$$



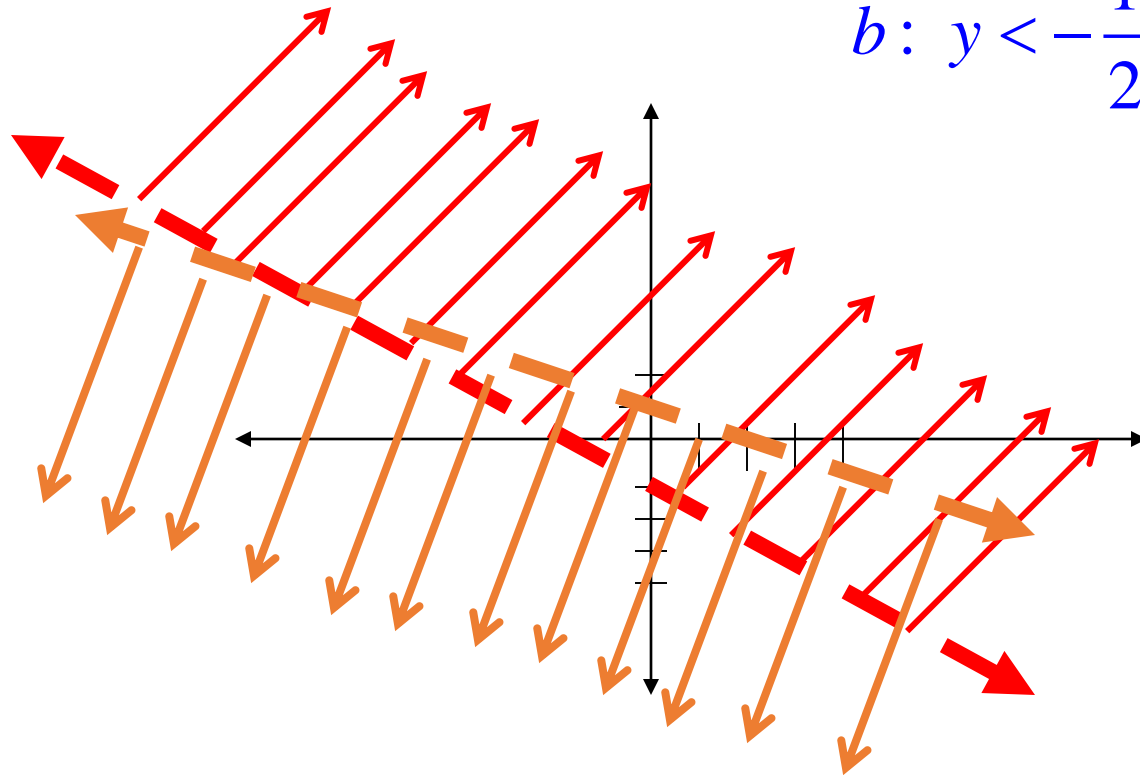
Solving Systems of Linear Inequalities

a: $3x + 4y > -4$

b: $x + 2y < 2$

a: $y > -\frac{3}{4}x - 1$

b: $y < -\frac{1}{2}x + 1$





Solving Systems of Linear Inequalities

$a: 3x + 4y > -4$

$b: x + 2y < 2$

The area between the green arrows is the region of overlap and thus the solution.

