

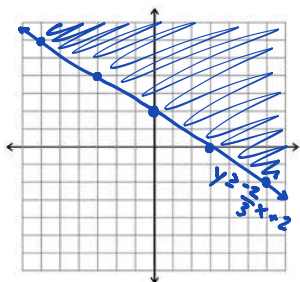
8-10 SYSTEMS OF INEQUALITIES BY GRAPHING

System of Inequalities: two (or more) inequalities with the same set of two (or more) variables.

Ex. 1: Graph the following inequality. **must be in slope-intercept form*

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

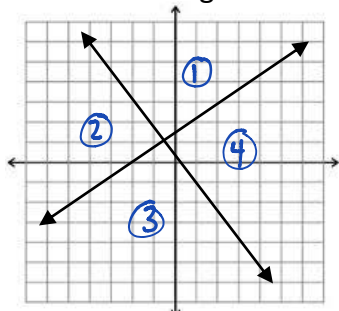
$$\frac{-2x}{-2x} \quad \frac{-2x}{-2x} \quad \frac{6}{-2x} \quad y \geq -\frac{2}{3}x + 2$$



Test (0,0)
 $0 \geq -\frac{2}{3}(0) + 2$
 $0 \geq 2$ → False (0,0) is not part of solution

Solutions:

1. Intersecting Lines

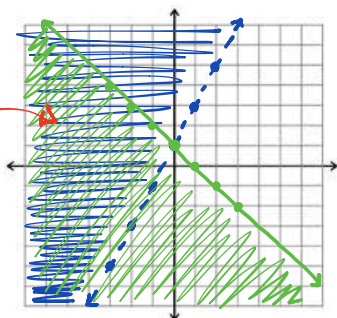


Solution will be one of the four regions

Ex. 2: Solve each system of inequalities by graphing.

A. $y > 2x + 1$

$y \leq -x + 1$

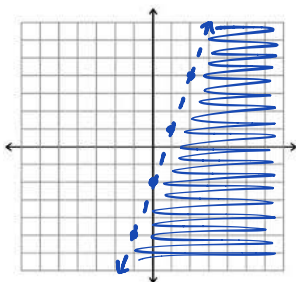


Test (0,0)
 $0 > 2(0) + 1$
 $0 > 1$
 False

Test (0,0)
 $0 \leq -(0) + 1$
 $0 \leq 1$
 True

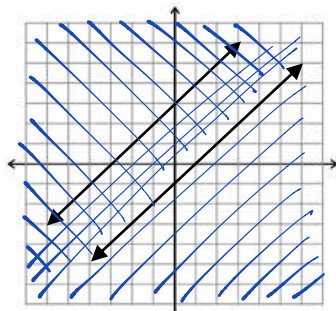
B. $3x - y > 2$

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



Test (0,0)
 $0 < 3(0) - 2$
 $0 < -2$ → False

2. Parallel Lines



Solution will be the overlapping region between lines

Note: 1. Graph in slope-intercept form

2. Solid vs. dotted line $\text{---} \leq \text{or} \geq$

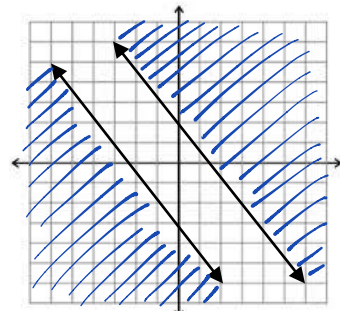
3. Choose ordered pair to substitute into inequality ** test a point on either side of line*

4. Shade correct side

True → shade side that contains test point

False → shade side that does not contain test point

3. Parallel Lines

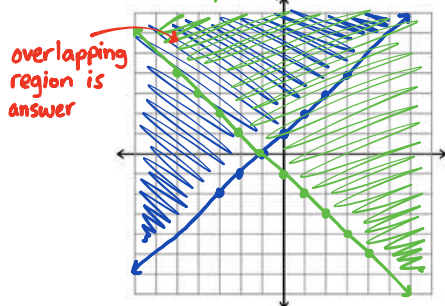


Solution will be "No Solution" b/c shaded regions do not overlap

B. $|x + 1| \leq y$

$x + 1 \leq y \Rightarrow y \geq x + 1$

$-x - 1 \leq y \Rightarrow y \geq -x - 1$

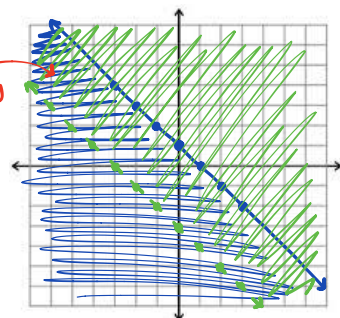


Test (0,0)
 $0 \geq 0 + 1$
 $0 \geq 1$
 False

Test (0,0)
 $0 \geq -0 - 1$
 $0 \geq -1$
 True

C. $y \leq -x + 1$

$y > -x - 3$



Test (0,0)
 $0 \leq -(0) + 1$
 $0 \leq 1$
 True

Test (0,0)
 $0 > -(0) - 3$
 $0 > -3$
 True