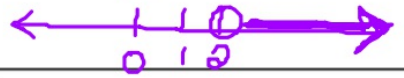
3.3 Solving Systems of Linear Inequalities

Equations

Learning Targets for today

- To be able to solve a system of linear inequalities by graphing.
- To be able to solve and model real-life situations using a system of linear inequalities.

$x > 2$



Vocabulary

System of Linear Inequality– two or more inequalities.

Ex: $y > x - 3$ $\quad 1 > 1-3?$ $\quad 1 > -2$ ✓

$y \leq 2x + 5$ $\quad 1 \leq 2(1)+5?$ $\quad 1 \leq 7$ ✓

(1,1) is a solution

Solution of a system of linear inequalities – An ordered pair (x, y) that makes the ALL inequalities in the system true!

Ex: (1, 1)

x, y

Rules to Graphing System of Linear Inequalities

1. Make sure the each equation is written in "slope-intercept form"

2. Graph the first inequality correctly and LIGHTLY shade or make a mark to remind yourself which side of that line the solutions are on.

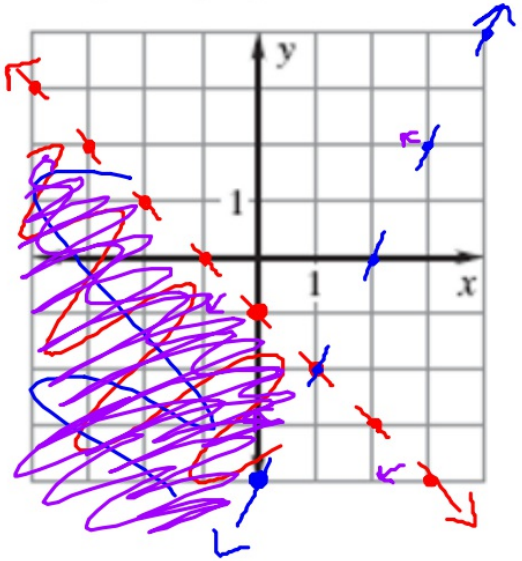
3. Graph the second inequality correctly (dashed or solid line?) and mark the side you would shade.

4. Finally find where both lines shading would overlap and shade in that area. (That is where all of the solutions will land!!!)

Graphing Systems of Linear Inequalities.

Graph the linear inequality system.

1. • $y < -x - 1$
   • $y > 2x - 4$

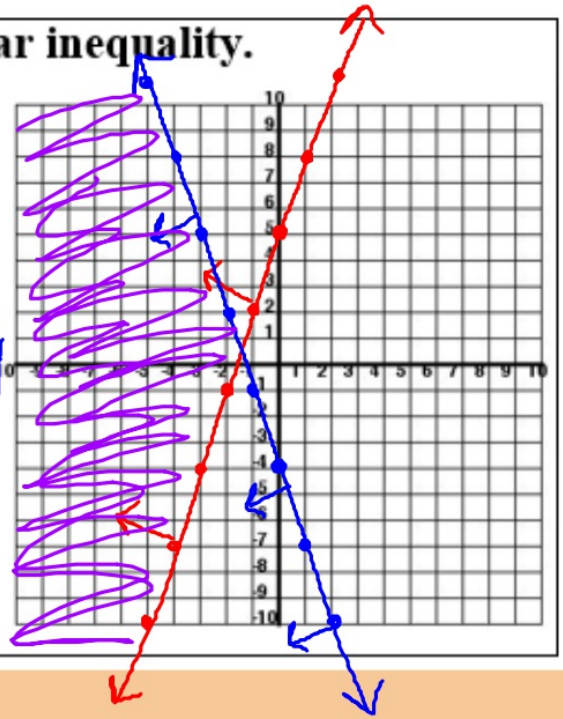


Graph the linear inequality.

2. • $y \geq 3x + 5$
   $3x + y \leq -4$

$-3x \quad -3x$

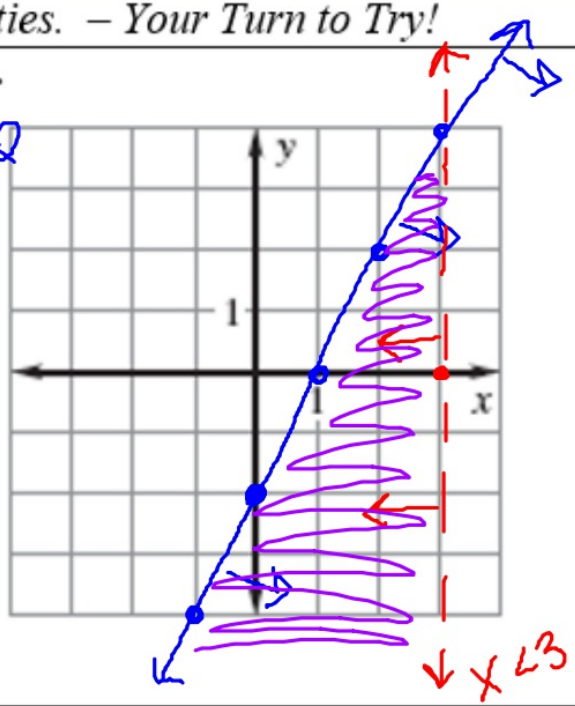
$y \leq -3x - 4$



Graphing Systems of Linear Inequalities. – Your Turn to Try!

Graph the linear inequality system.

1. • $y \leq 2x - 2$ $0 \leq 2(0) - 2$? $0 \not\leq 2$
   • $x < 3$ $0 < 3$? ✓
   $x = 3$?



Graph the linear inequality system.

2. • $-2x + y > 3$ (+2x, +2x) • $y > 2x + 3$
   $-3x - y \leq 5$
   (+3x, +3x)

$$-y \leq 3x + 5$$

$$\frac{-y}{-1} \leq \frac{3x}{-1} + \frac{5}{-1}$$

• $y \geq -3x - 5$