

### Lesson 7.3: Solving Systems of Inequalities

$$\begin{cases} 2x - y < 5 \\ x + 3y \geq 6 \end{cases}$$

$y > 2x - 5$  (dashed line, arrow pointing up-right)

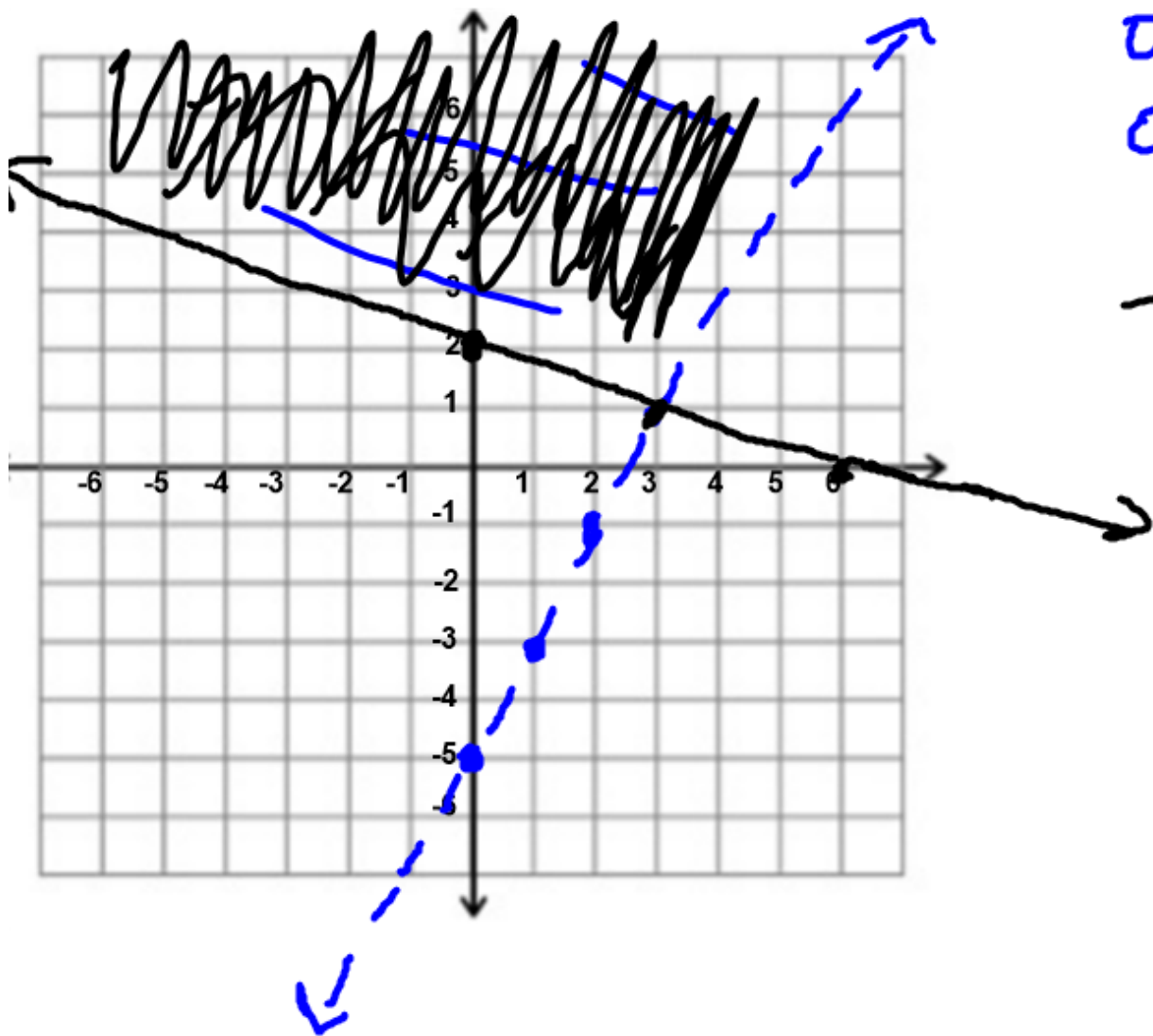
$y \geq -\frac{1}{3}x + 2$  (solid line, arrow pointing down-right)

Test Point  $(x, y)$

$$0 > 2(0) - 5$$
$$0 > -5$$

Test:  $(0, 0)$

$$0 \geq -\frac{1}{3}(0) + 2$$
$$0 \not\geq 2$$



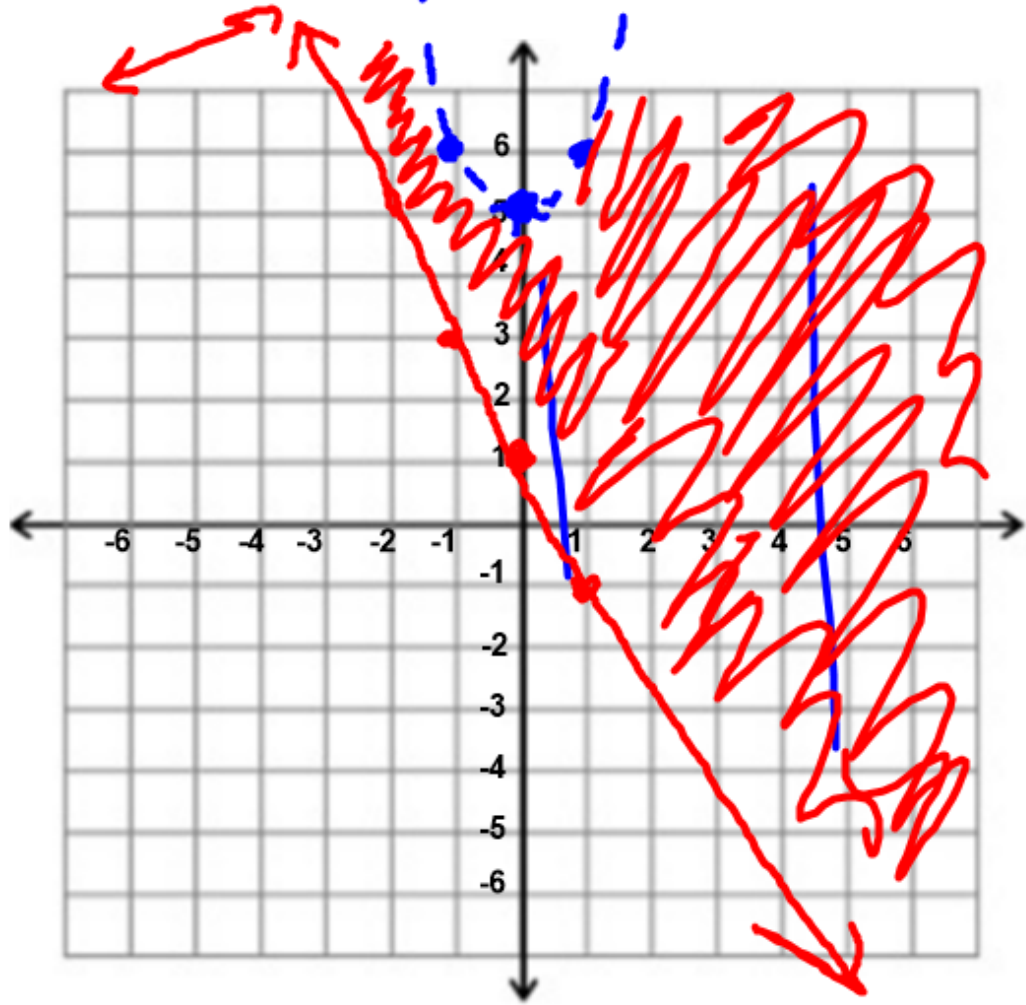
$\geq, \leq \rightarrow$  Solid line

$>, < \rightarrow$  dotted line

$$\begin{array}{ccc} -x > 5 \\ \hline \hline \\ \downarrow \\ \text{Switch} \\ x < -5 \end{array}$$

If you divide  
by a (-),  
then  
Switch  
the ~~is~~  
inequality

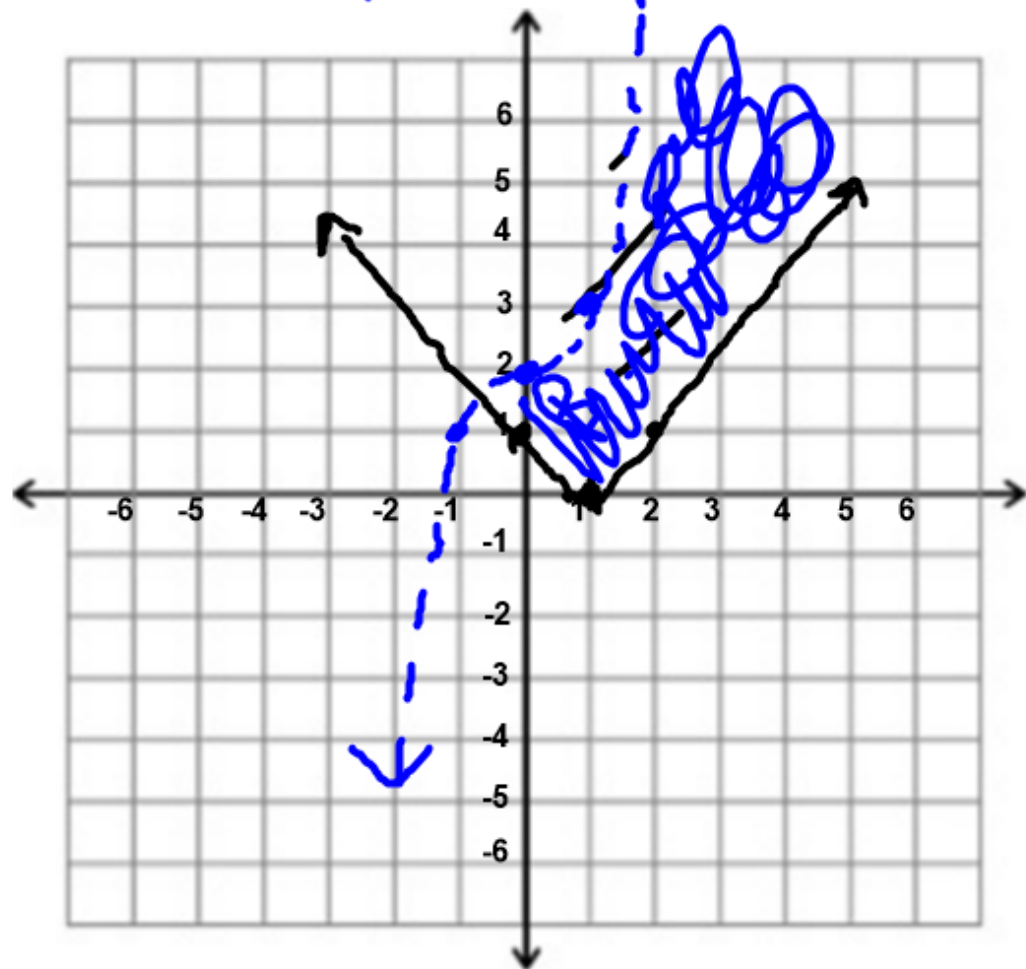
$$\begin{cases} y < x^2 + 5 \\ y \geq -2x + 1 \end{cases}$$



$$y \geq |x - 1|$$

$$y < x^3 + 2$$

x y  
2 0 1



Test: (0, 0)

$$0 \geq |0 - 1|$$

$$0 \neq 1$$

Test: (0, 0)

$$0 < 0^3 + 2$$

$$0 < 2 \checkmark$$

$$\begin{cases} y < 3x + 5 \\ x < 3 \\ y \geq \sqrt{x+1} \end{cases}$$

