

Algebra 1

5.6

Graph linear inequalities on the coordinate plane

Solve inequalities by graphing

linear

boundary

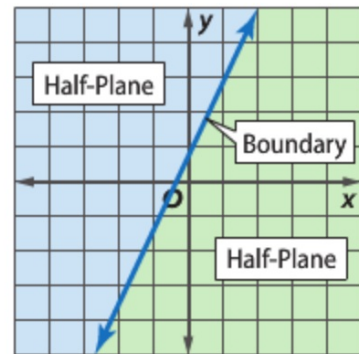
half-plane

open

closed

test point

whiteboards



Key Concept Graphing Linear Inequalities

Step 1 Graph the boundary. Use a solid line when the inequality contains \leq or \geq .

Use a dashed line when the inequality contains $<$ or $>$.

Step 2 Use a test point to determine which half-plane should be shaded.

Step 3 Shade the half-plane that contains the solution.

Hint: always use an EQUATION when you graph the boundary.

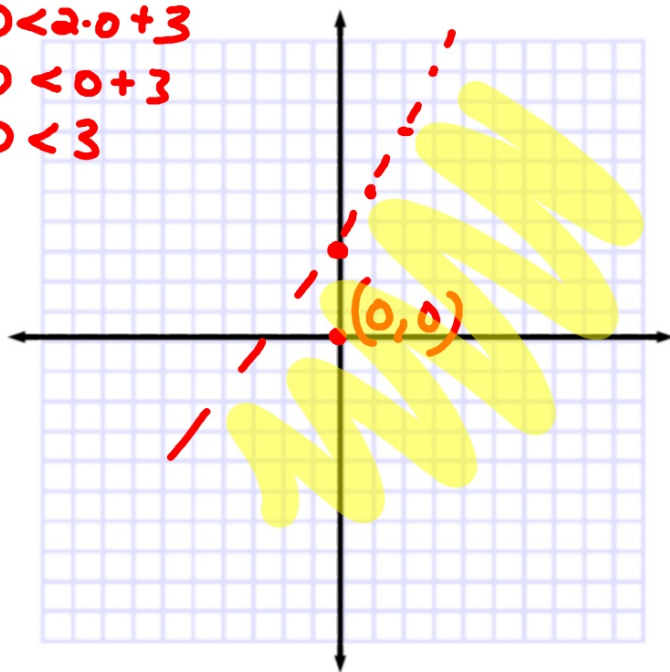
Graph

$$y < 2x + 3$$

$$0 < 2 \cdot 0 + 3$$

$$0 < 0 + 3$$

$$0 < 3$$

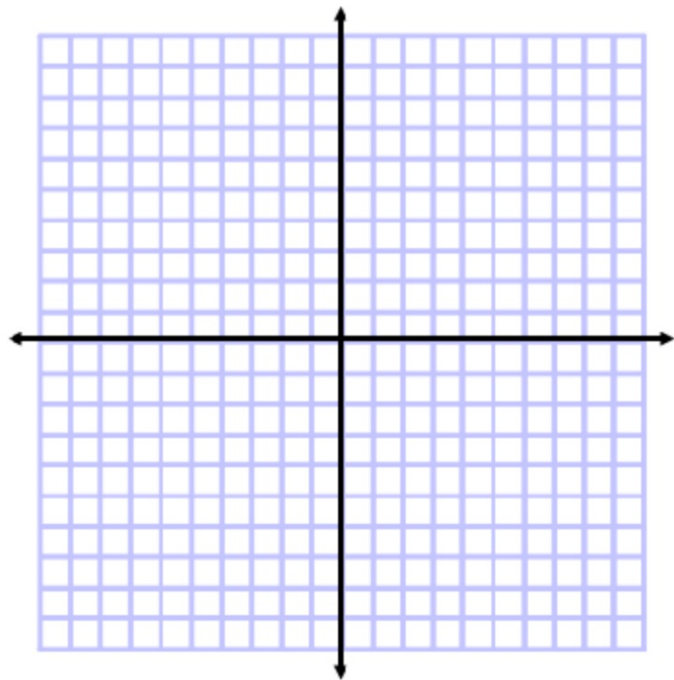


whiteboards

Guided Practice Graph each inequality.

1A. $y > \frac{1}{2}x + 3$

$$y = mx + B$$



How is this problem different?

$$y = mx + b$$

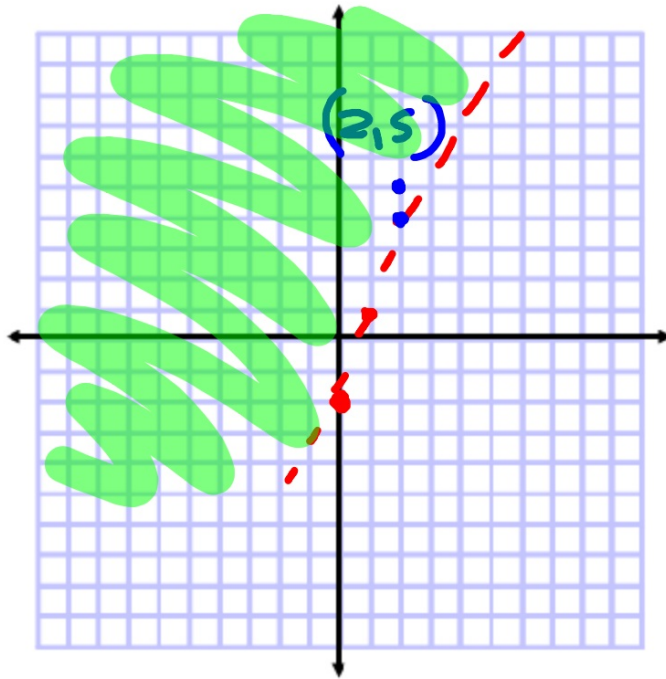
Example 1 Graph an Inequality (< or >)

Graph $3x - y < 2$.

$$\begin{array}{r} 3x - y < 2 \\ -3x \quad -3x \\ \hline -y < -2 \end{array}$$

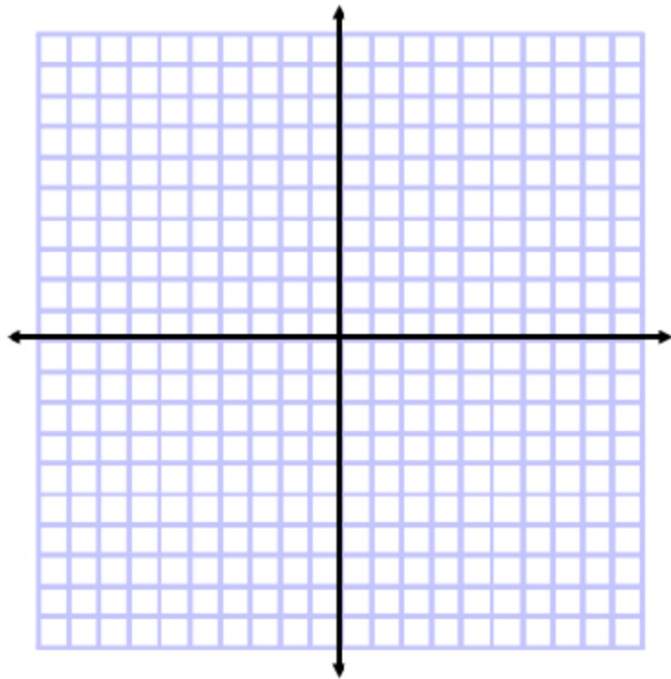
$$\begin{array}{r} -y < -3x + 2 \\ \frac{-1}{-1} \quad \frac{-1}{-1} \quad \frac{-1}{-1} \\ \hline y < 3x - 2 \end{array}$$

Locate the boundary
(hint: $y =$)



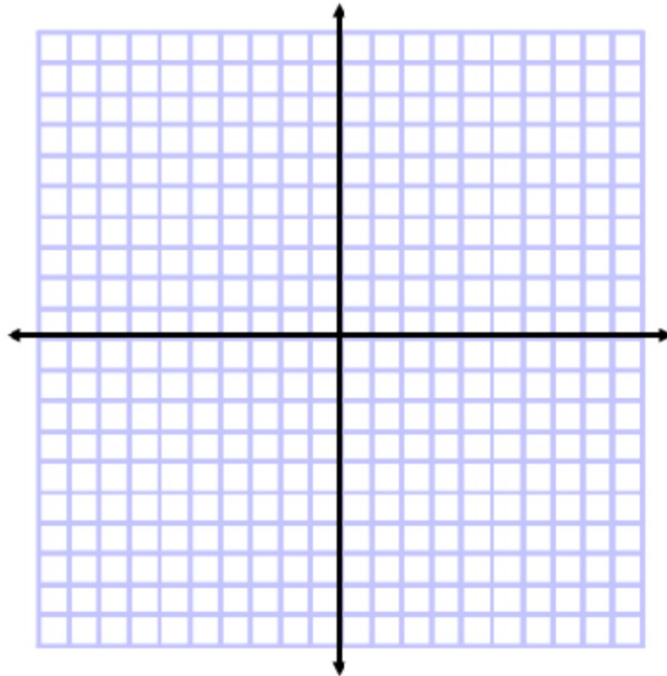
1B. $x - 1 > y$

$$y = x - 1$$



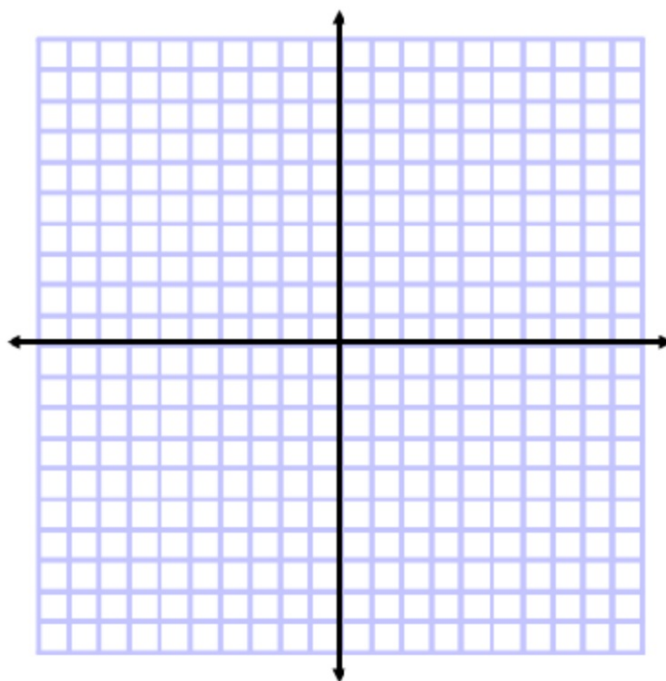
Example 2 Graph an Inequality (\leq or \geq)

Graph $x + 5y \leq 10$.

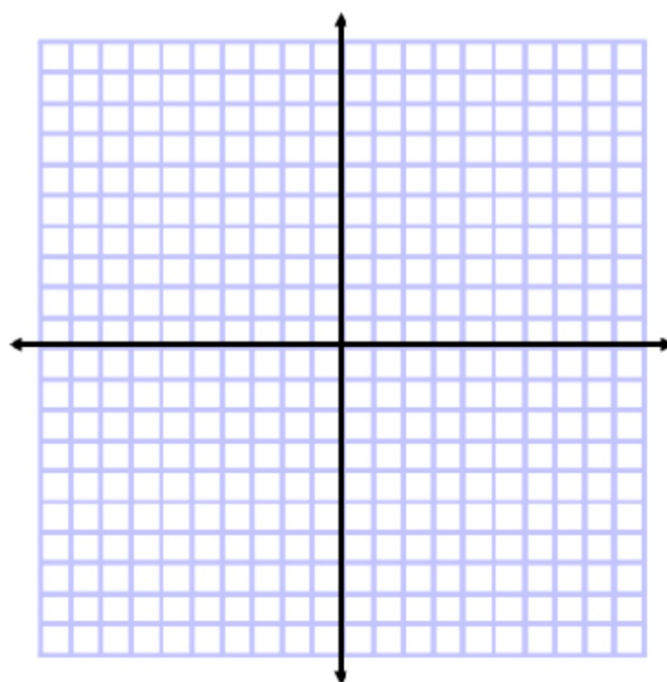


Graph each inequality.

2A. $x - y \leq 3$



2B. $2x + 3y \geq 18$



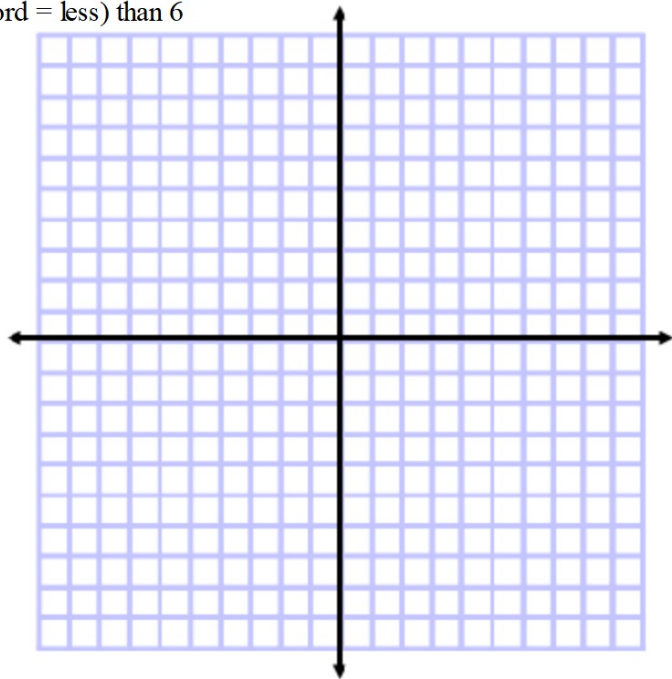
Example 3 Solve Inequalities From Graphs

Use a graph to solve $3x + 5 < 6$

Graph $y = 3x + 5$

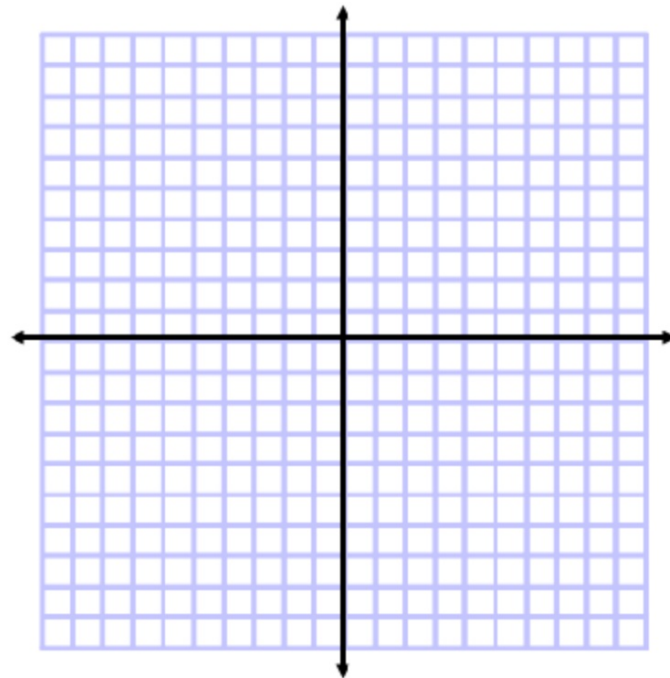
Graph $y = 6$

Where is $3x + 5$ lower on the graph (smaller y-coord = less) than 6



Use a graph to solve each inequality.

3A. $4x - 3 \geq -7$



3B. $-2x + 6 > 12$

