Algebra 1 5.6

Think of 2 numbers whose sum is 10.

Be original.

19 + -9 12 + -2

10 + 0 -1 + 11

-1,000,000 + 1,000010

-69 + 79 5 + 5

100 + -90 1 + 9

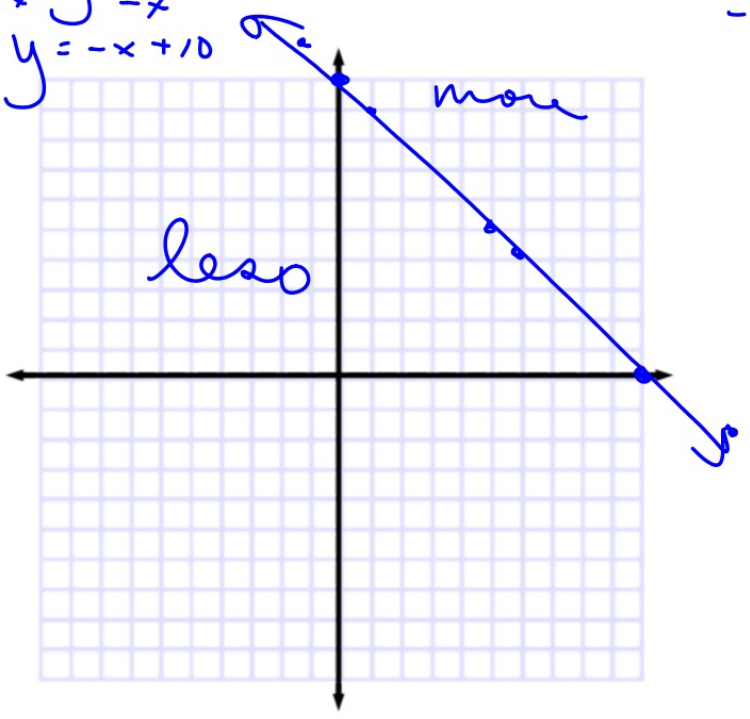
6 + 4 -67 + 77

12 + -2

$x + y = 10$

$-x \quad -x$

$y = -x + 10$



Think of 2 numbers with a sum that is less than 10

Algebra 1 5.6

Graph linear inequalities on the coordinate plane

Solve inequalities by graphing

linear

boundary

half-plane

open

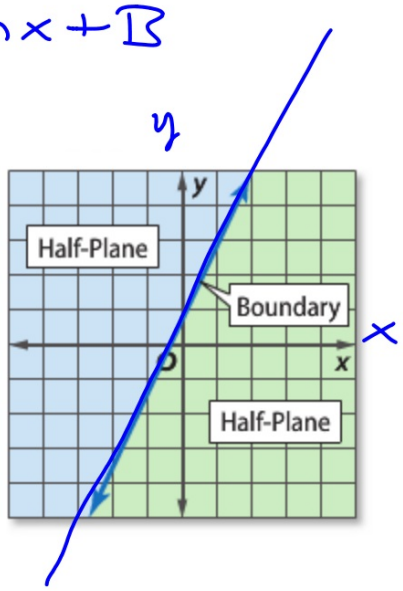
closed

test point

whiteboards

$y = mx + B$

$> \; < \; \geq \; \leq$



Graph a linear equation: use slope-intercept form

test point

$y \leq 3x + 1$

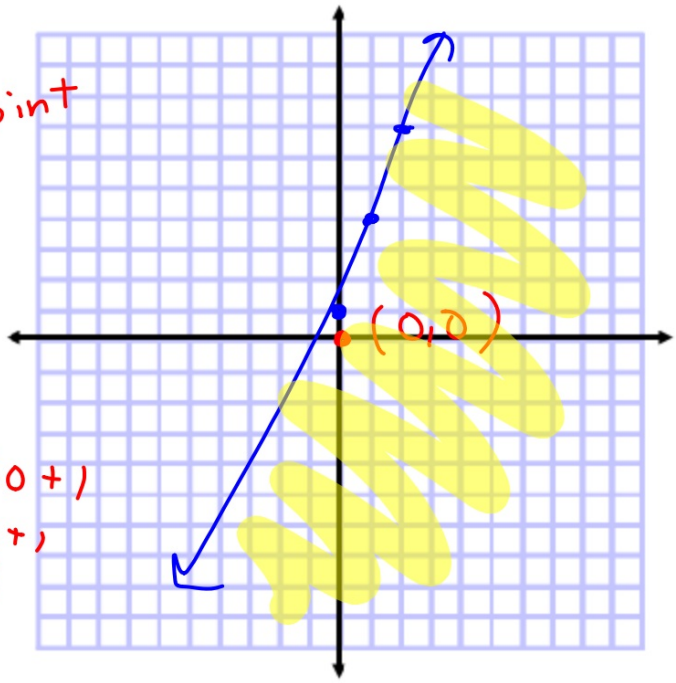
$y = \frac{3}{1}x + 1$

Shade ⊤

$0 \leq 3 \cdot 0 + 1$

$0 \leq 0 + 1$

$0 \leq 1$



KeyConcept 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.

$2x - y \geq 0$

$-2x \quad -2x$

$-y \leq -2x + 0$

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

Graph

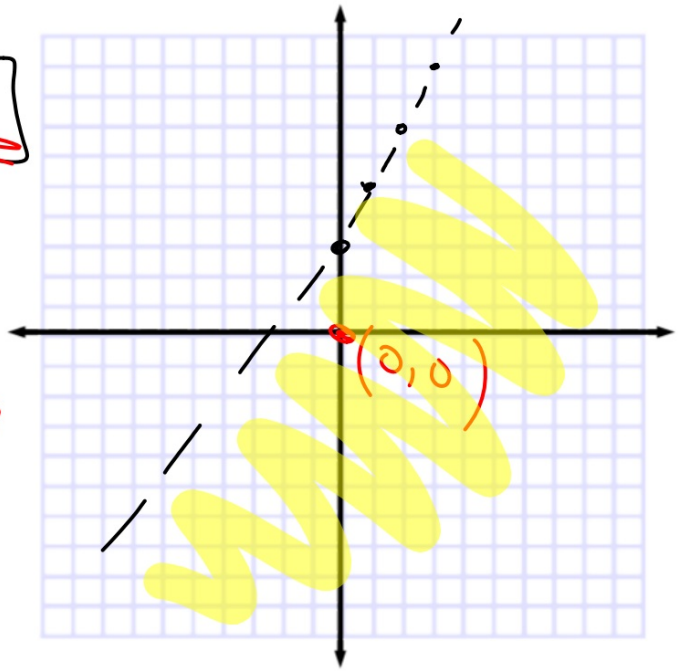
$y < 2x + 3$

$y = 2x + 3$

$0 < 2 \cdot 0 + 3$

$0 < 0 + 3$

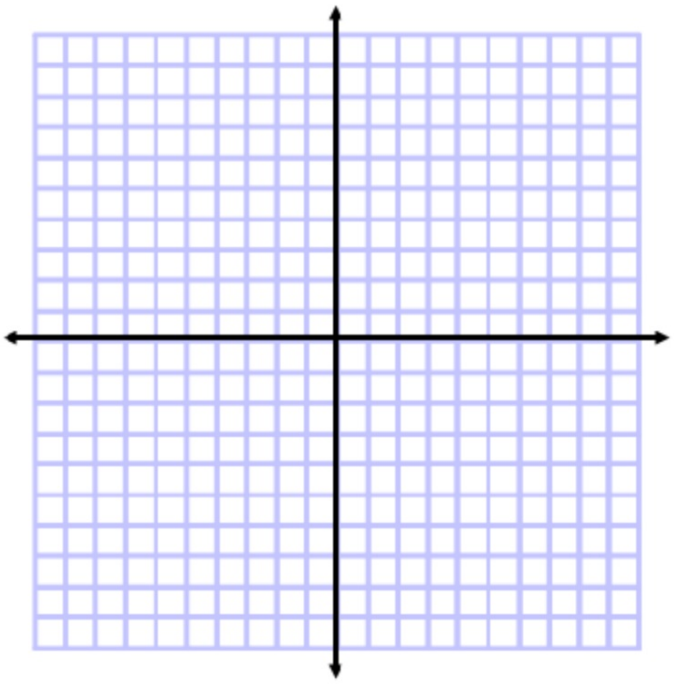
$0 < 3$



whiteboards?

GuidedPractice **Graph each ine**

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



How is this problem different?

Locate the boundary (hint: y=)

Example 1 Graph an Inequa

Graph $3x - y < 2$.

$3 \cdot 0 - 0 < 2$

$0 - 0 < 2$

$0 < 2$

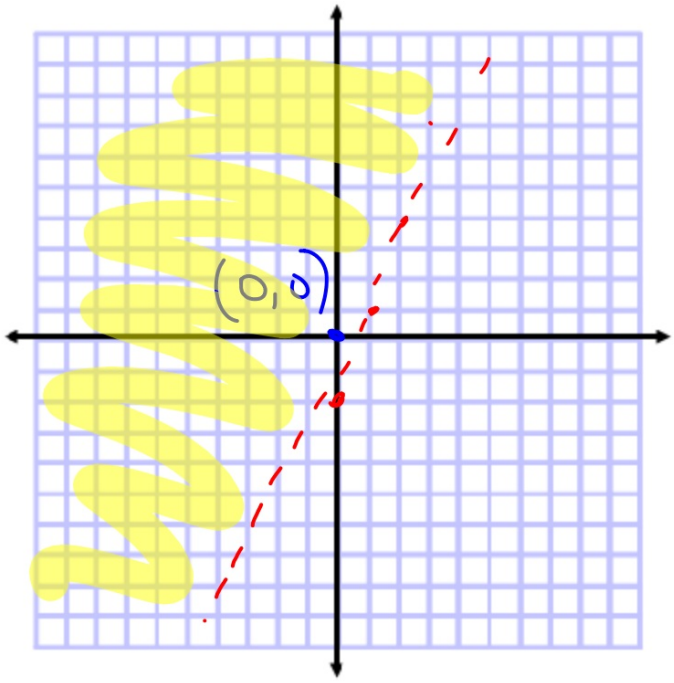
$3x - y = 2$

$-3x \quad -3x$

$-y = -3x + 2$

$\frac{-y}{-1} = \frac{-3x}{-1} + \frac{2}{-1}$

$y = 3x - 2$



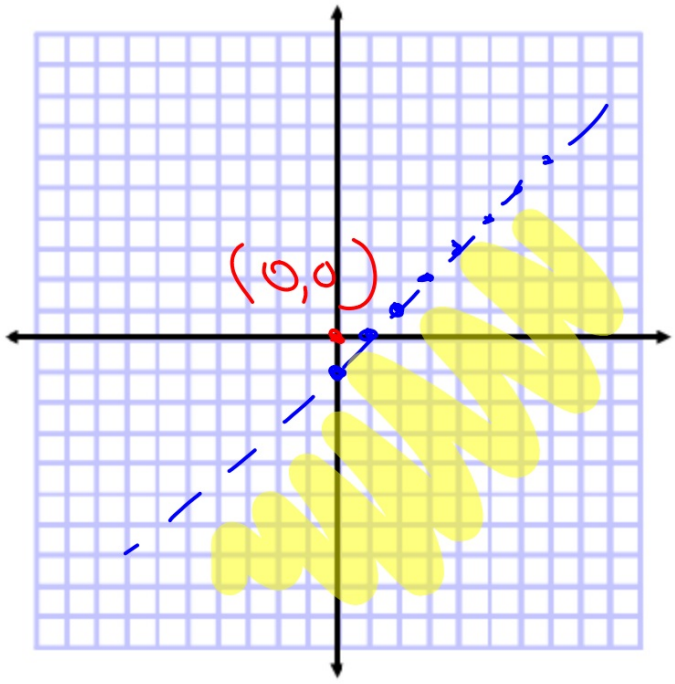
1B. $x - 1 > y$

$0 - 1 > 0$

$-1 > 0$

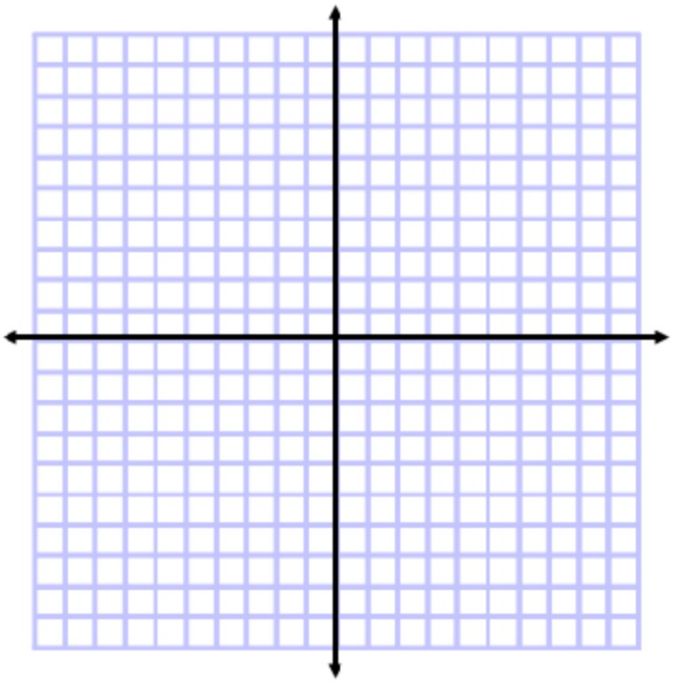
$x - 1 = y$

$y = \frac{1}{1}x - 1$



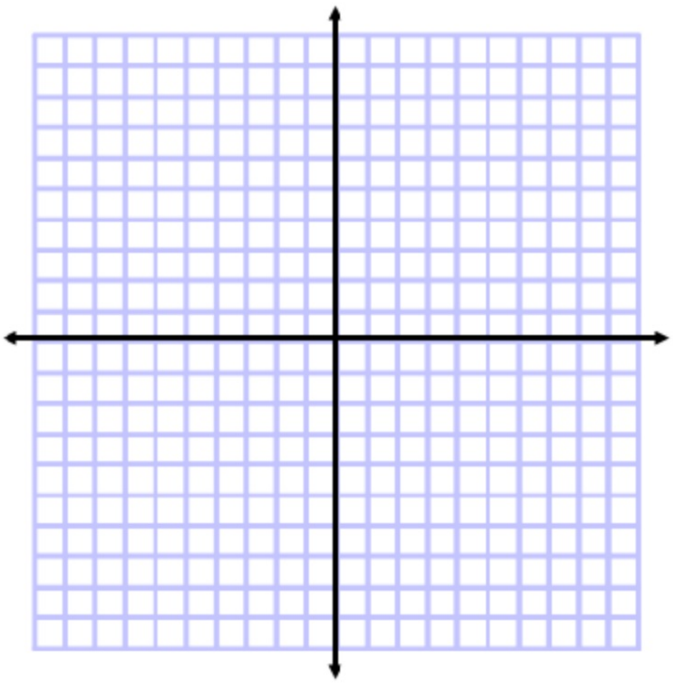
Example 2 Graph an Inequality ($\leq$ or $\geq$)

Graph $x + 5y \leq 10$.

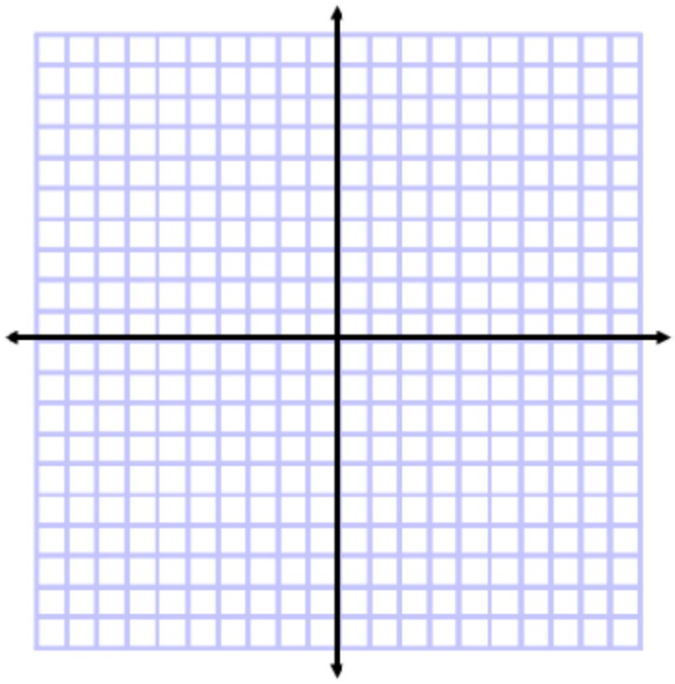


Graph each inequality.

2A. $x - y \leq 3$

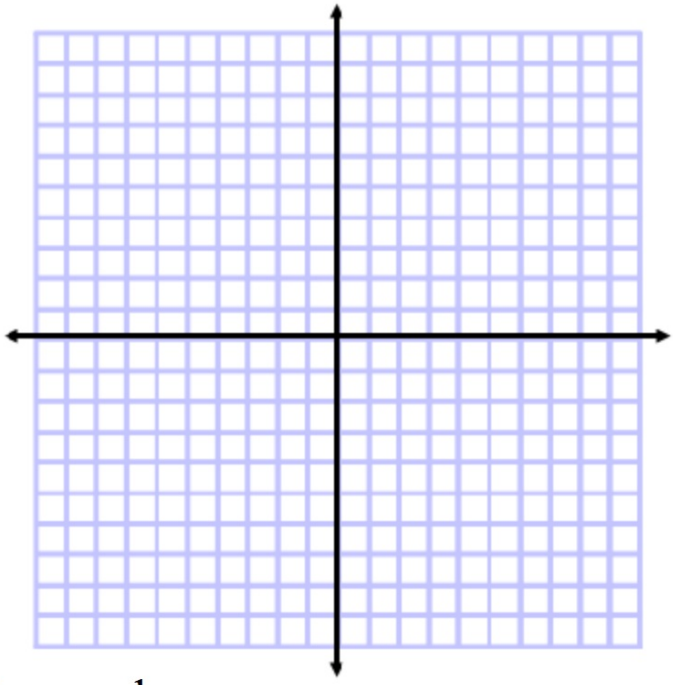


2B. $2x + 3y \geq 18$



Example 3 Solve Inequalities From Graphs

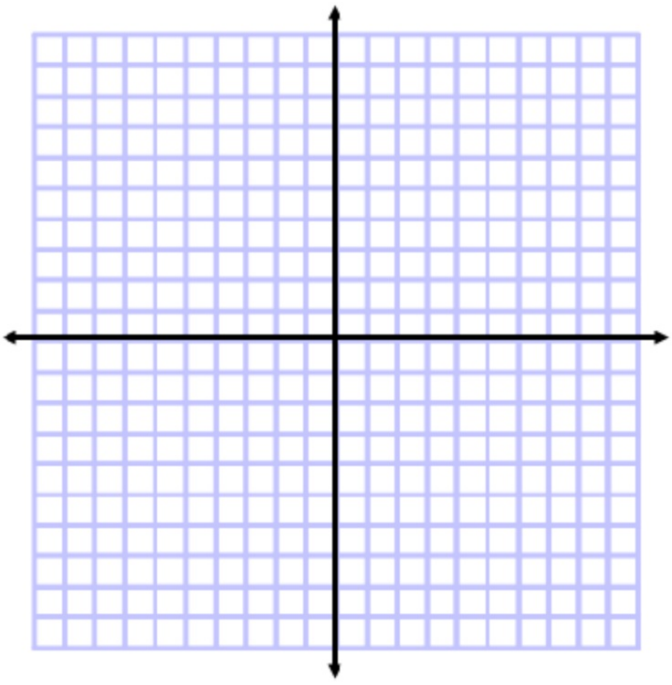
Use a graph to solve $3x + 5 <$ 6



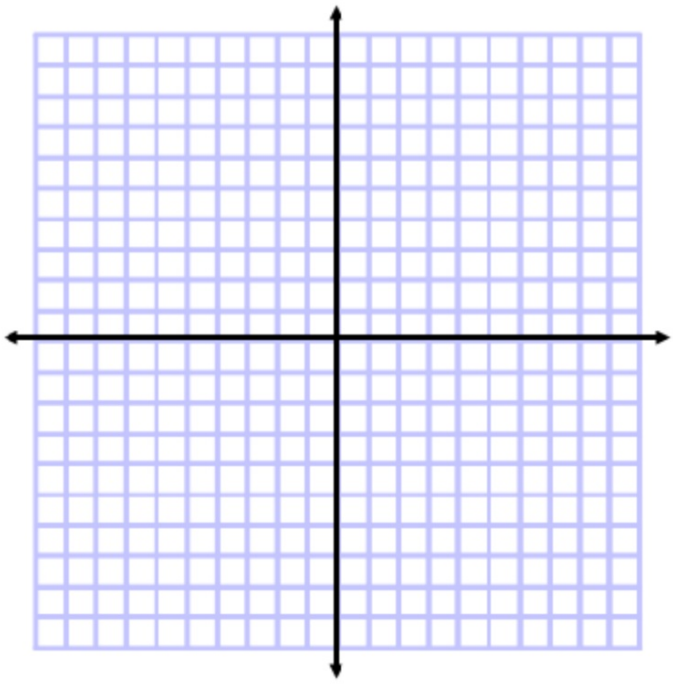
Graph y=3x + 5
Graph y=6
Where is 3x+5 lower on the graph
(smaller y-coord = less) than 6

Use a graph to solve each inequality.

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



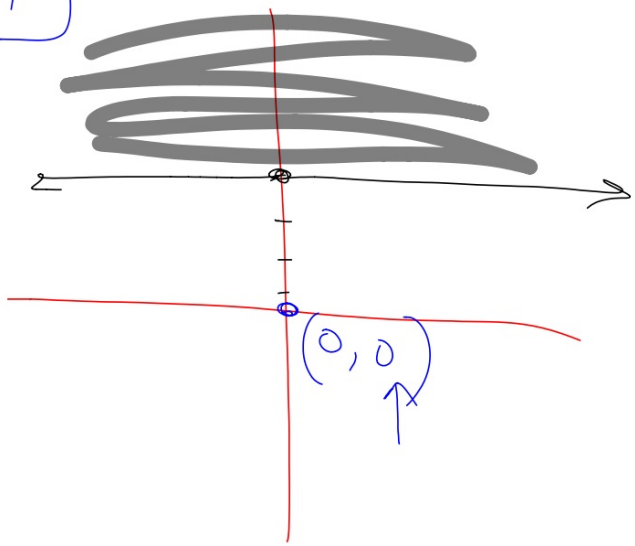
3B. $-2x + 6 > 12$



$y \geq 4$

$y = 4$

$0 \geq 4$



$x = -2$

$x \leq -2$

$0 \leq -2$