Algebra 1 5.6
Think of 2 numbers with a sum that is less than 10
Be original.

$y = -x + 10$
$+x$

$x + y = 10$
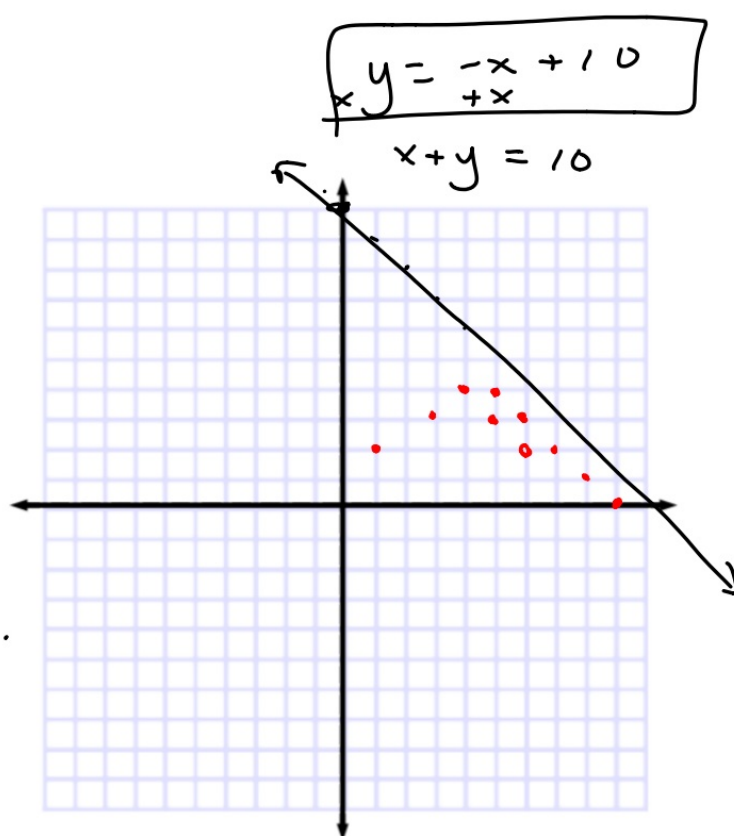
(6,2)   (9,0)
(5,4)   (8,1)
(5,3)   (7,2)
(4,4)   (6,3)
(3,3)   (1,2)

Algebra 1   5.6
Graph linear inequalities on
the coordinate plane $y = mx + B$
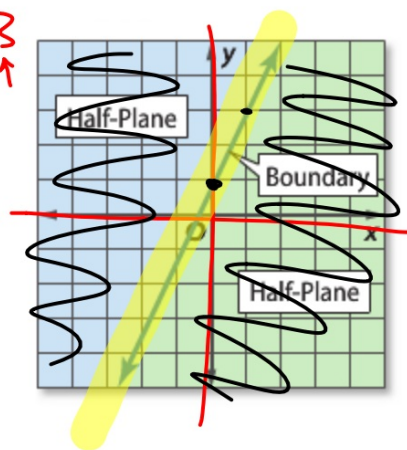Solve inequalities by graphing
linear $y \leq mx + B$
boundary
half-plane $y \geq mx + B$
open $>$ $<$ o – – – –
closed $\geq$ $\leq$ ● ——— —
test point
whiteboards

$y = 2x + 1$

Half-Plane

Boundary

Half-Plane

Graph a linear
equation:
use slope-
intercept form

$$y = \frac{-x}{\frac{-1}{1}} + 10$$
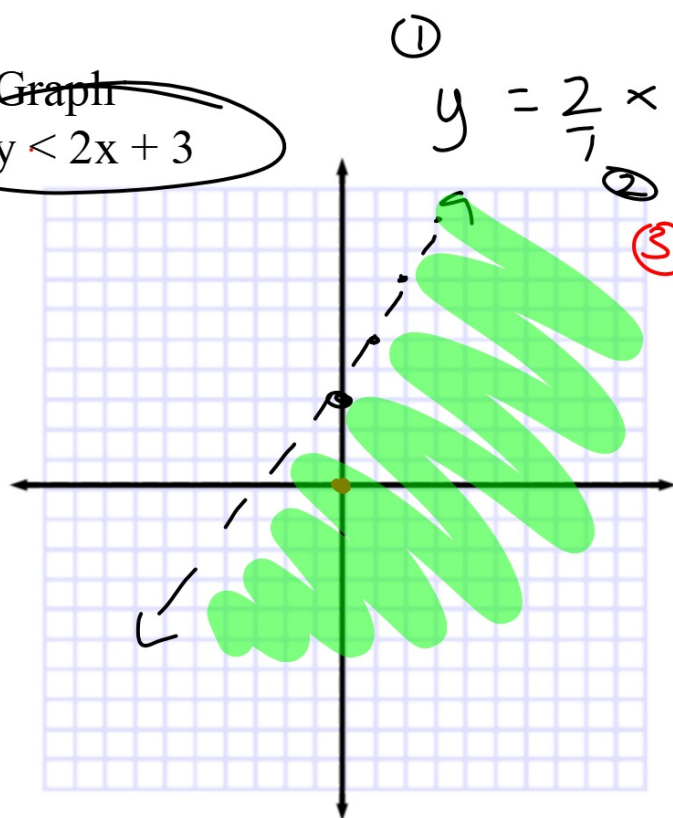
$$y = -x + 10$$
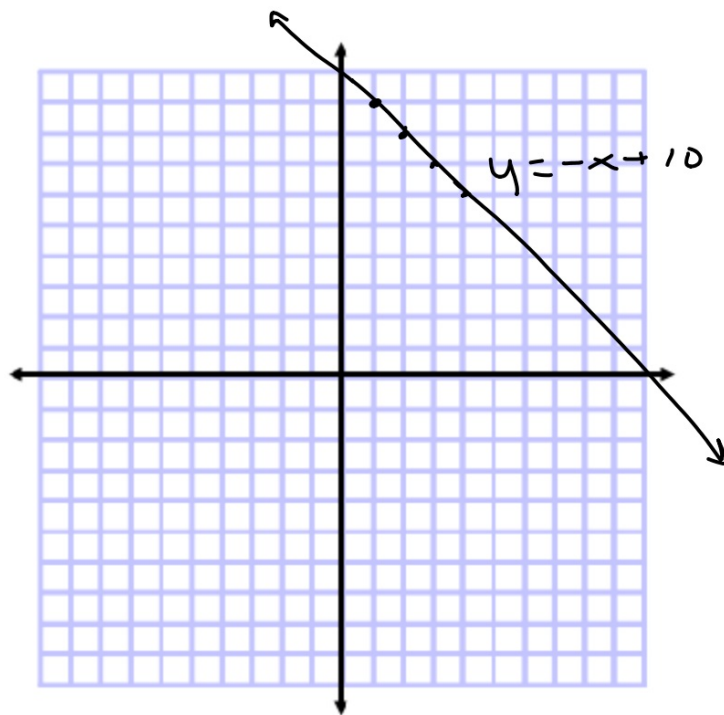
KeyConcept Graphing Linear Inequalities

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.

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

Graph
$y < 2x + 3$

① $y = \frac{2}{1} x + 3$

②

③ $(0,0)$

$0 < 2 \cdot 0 + 3$

$0 < 0 + 3$

$0 < 3$ ✓

whiteboards

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

$$0 > \frac{2}{3} \cdot 0 + 1$$

$$0 > 0 + 1$$

$$0 > 1$$

GuidedPractice Graph each in

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

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

$$0 > \frac{1}{2} \cdot 0 + 3$$

$$0 > 0 + 3$$

$$0 > 3$$

(0,0)
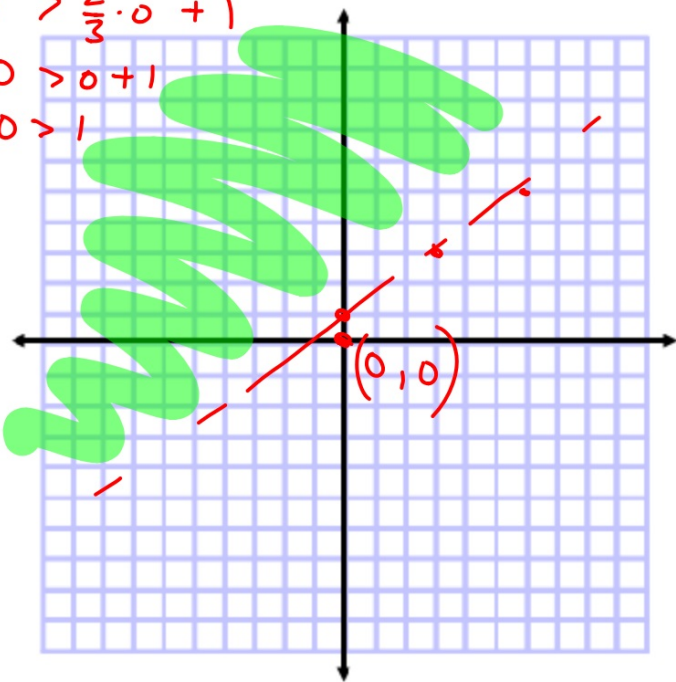
How is this problem different?

Locate the boundary
(hint: y=   )

Example 1 Graph an Inequality (< or >)

Graph $3x - y < 2$.

$3 \cdot 0 - 0 < 2$
$0 - 0 < 2$
$0 < 2$

$3x - y = 2$
$-3x \qquad -3x$

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

$$y = 3x - 2$$

$(0, 0)$

$0 - 1 > 0$

$-1 > 0$
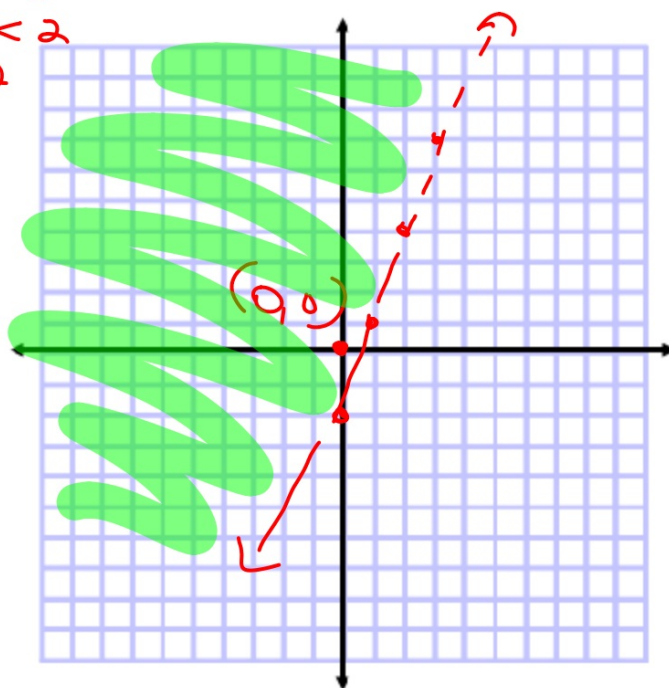
1B. $x - 1 > y$

$x - 1 = y$

$y = \dfrac{1}{1}x - 1$
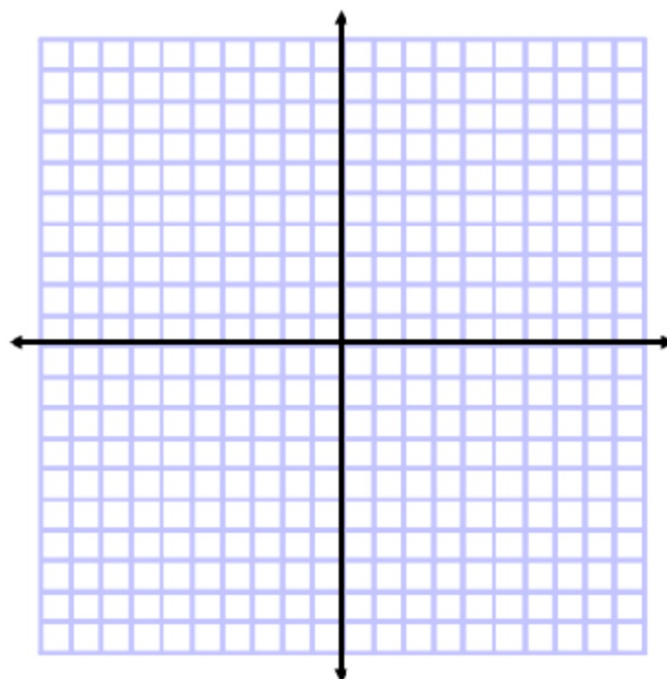
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1) $y < 2x + 3$
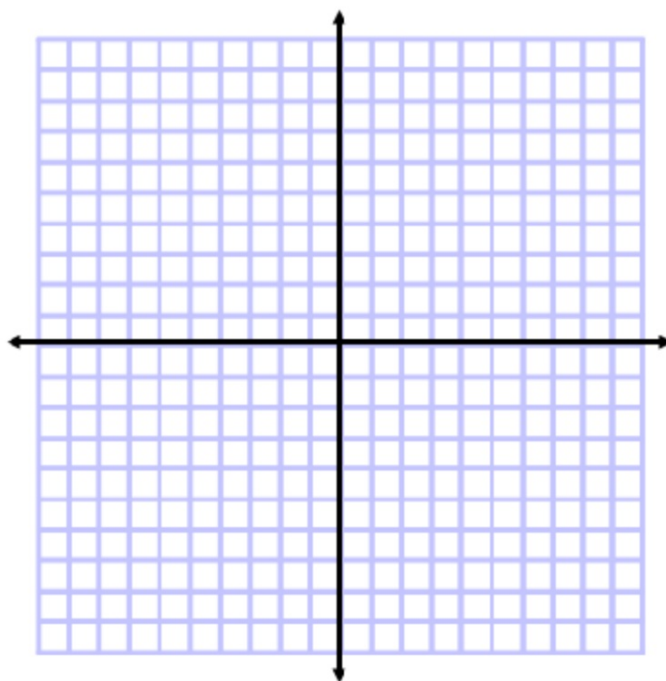
2) $y > x - 5$

$(0,0)$
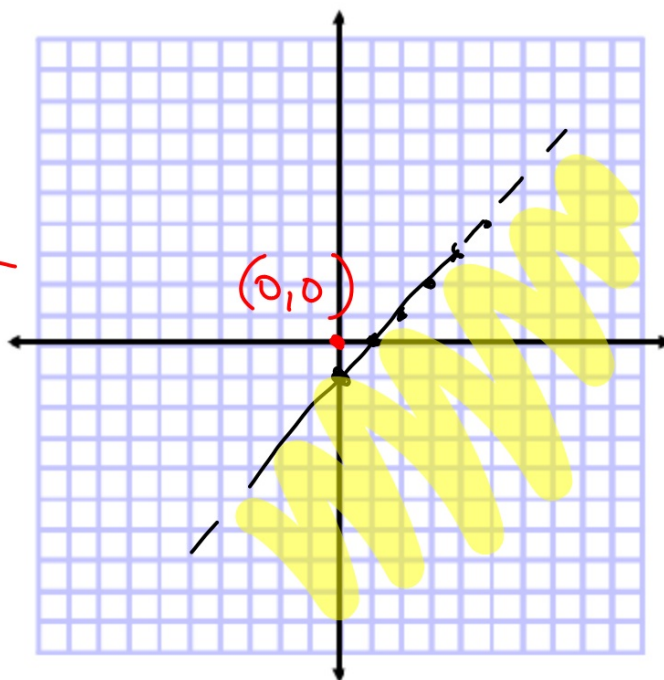
Example 2 Graph an Inequality ($\leq$ or $\geq$)
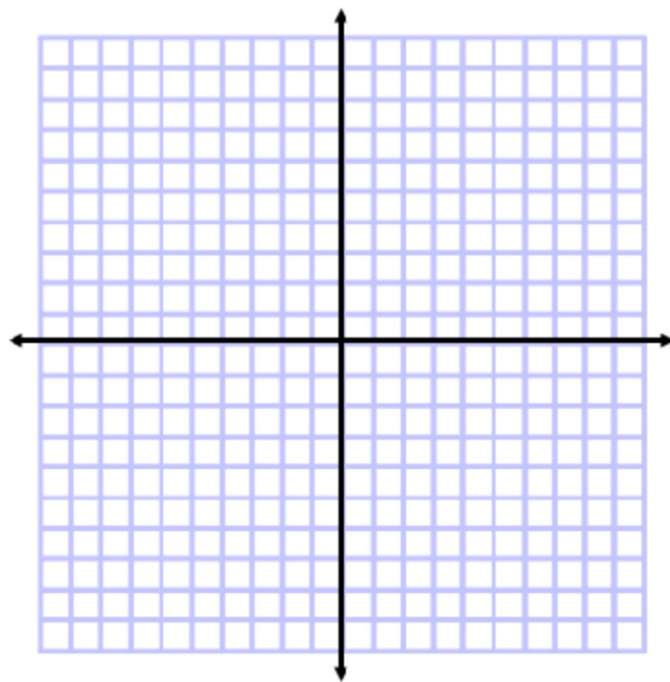
Graph $x + 5y \leq 10$.

Graph each inequality.
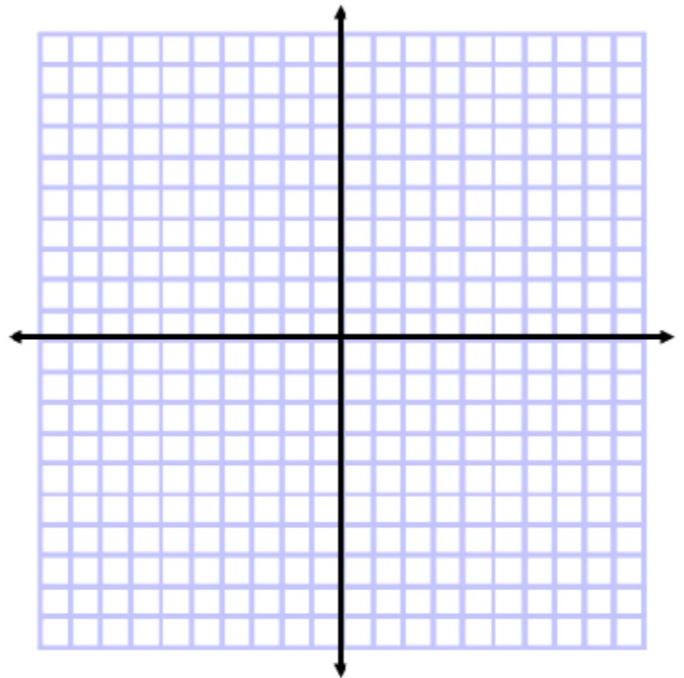
2A. $x - y \leq 3$

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

Example 3 Solve Inequalities From Graphs
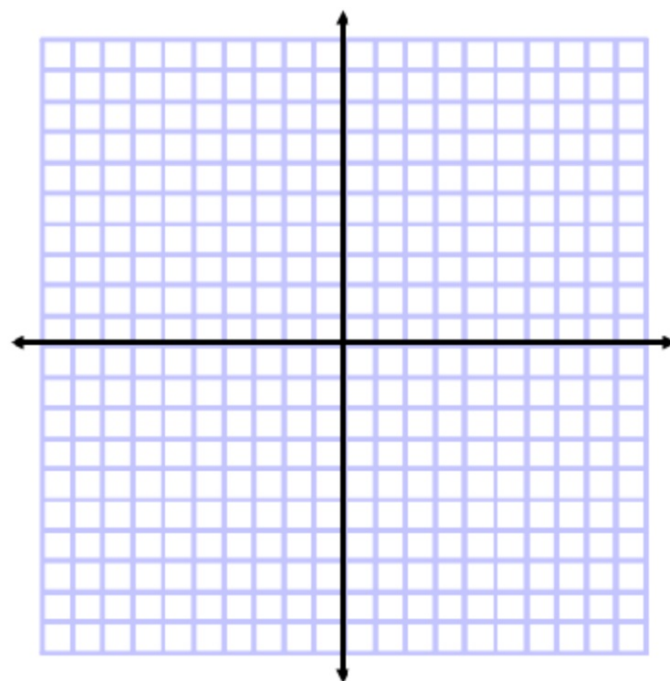
Use a graph to solve $3x + 5 < 6$

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. $-2x + 6 > 12$