Graphs of Linear Inequalities

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Sauyo High School

How to Graph Linear Inequalities?

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4. If the inequality is satisfied, shade the region containing that point. If not, shade the other region.

Example 1

Graph the inequality $y \leq 2x + 1$.

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Original inequality

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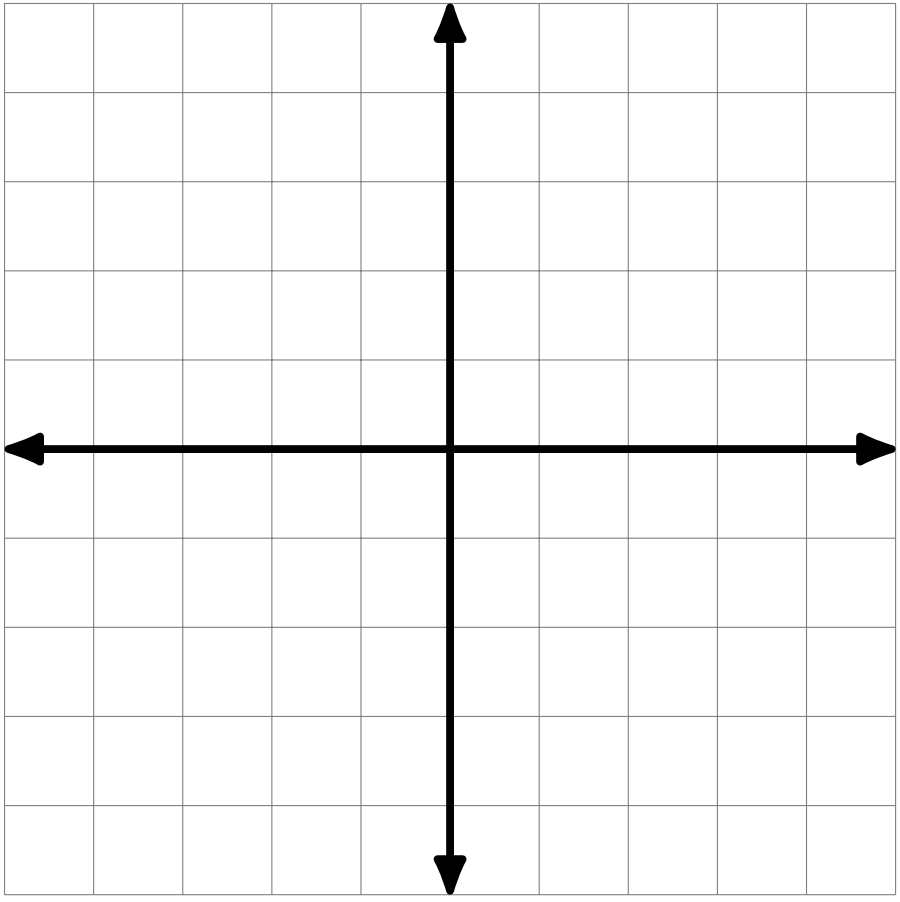

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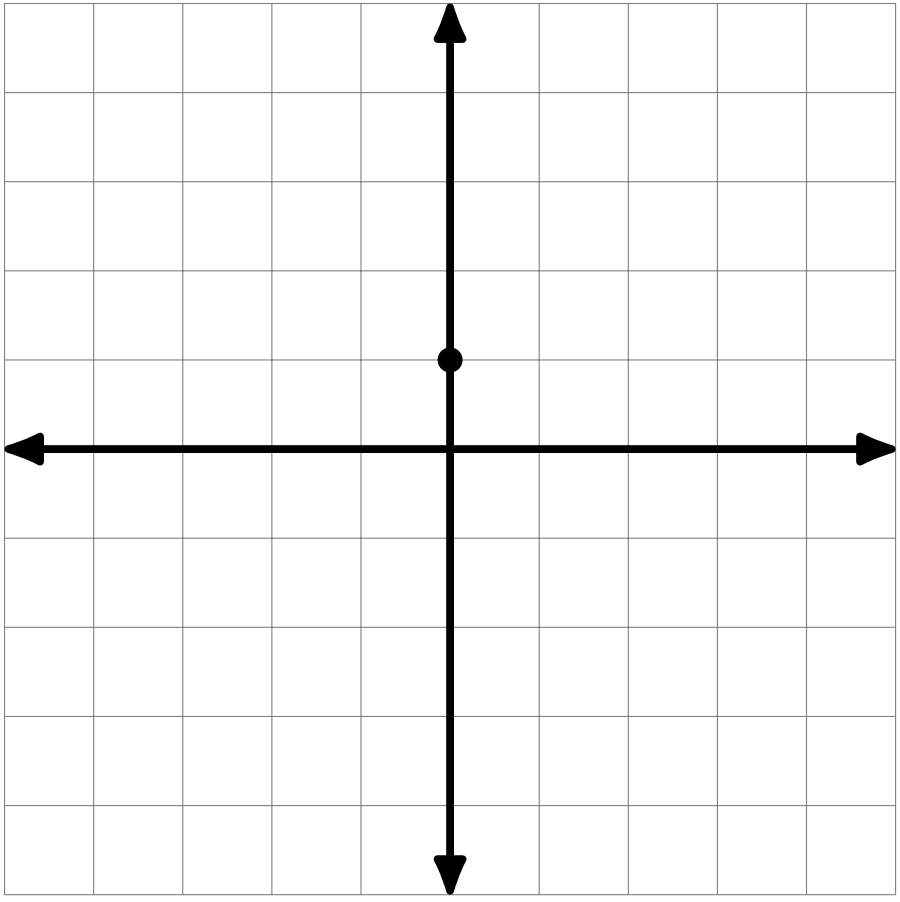

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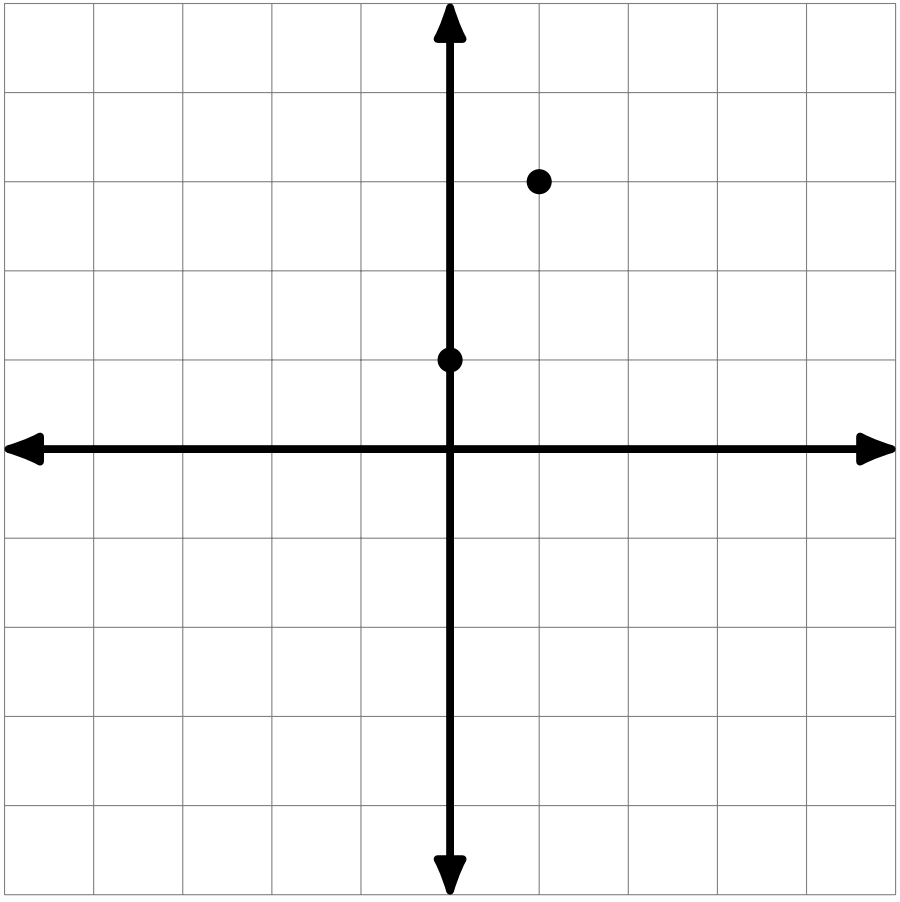

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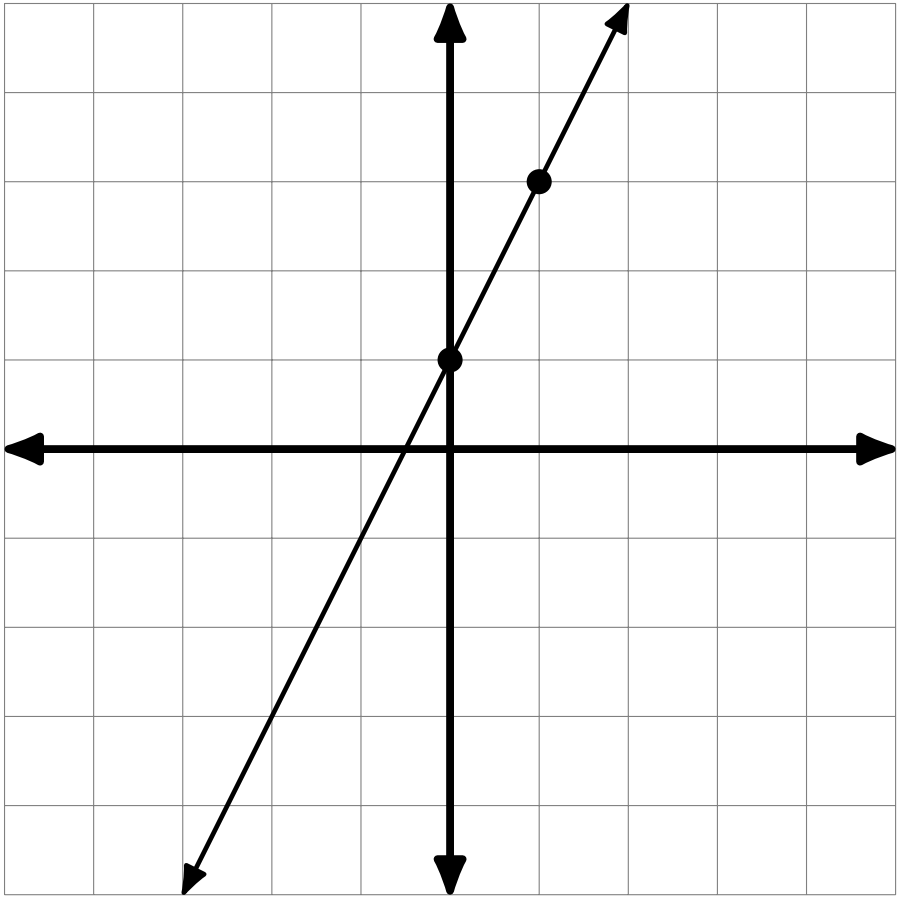

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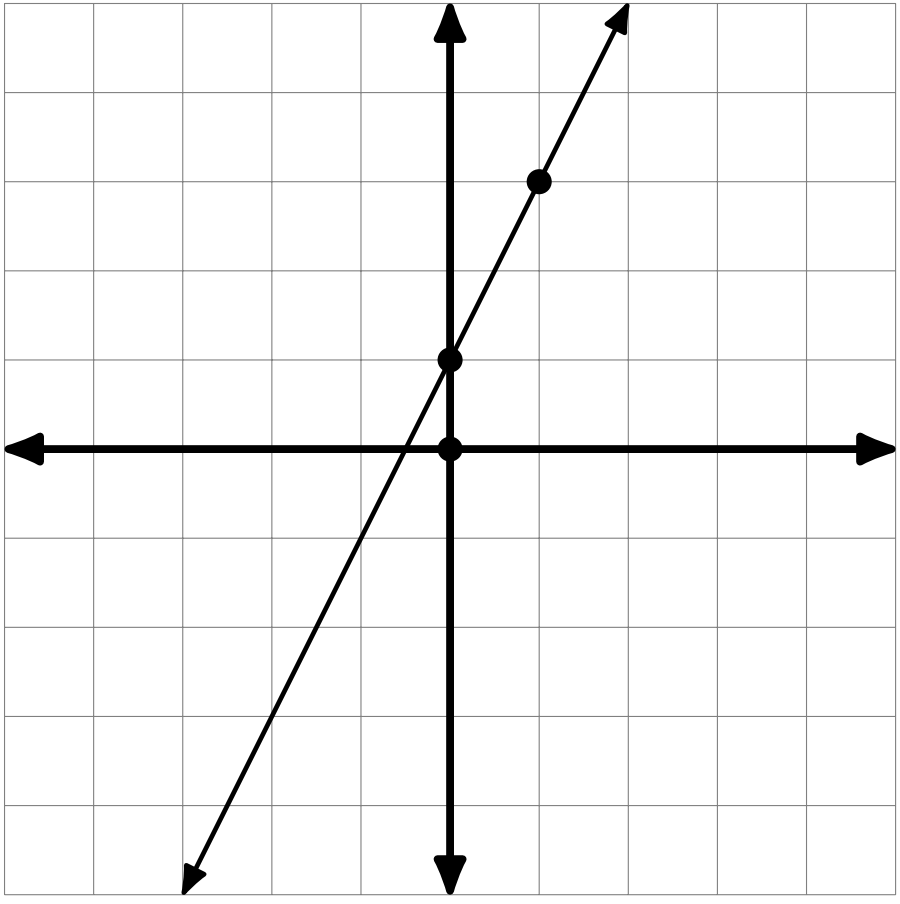

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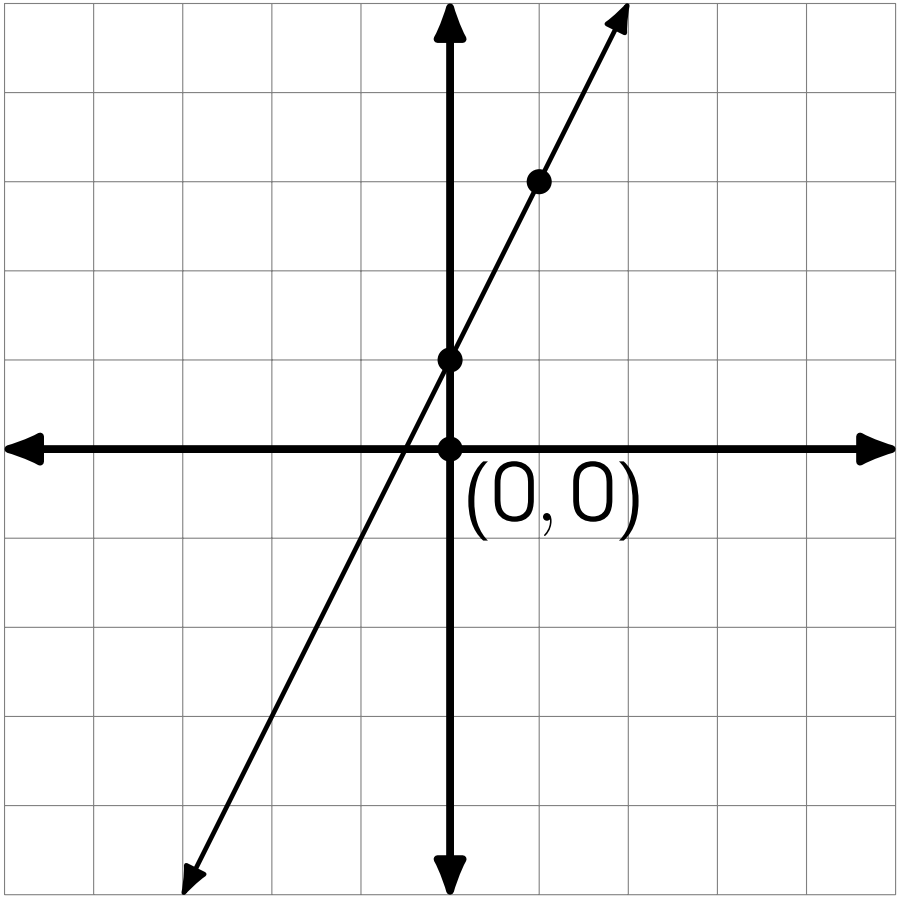

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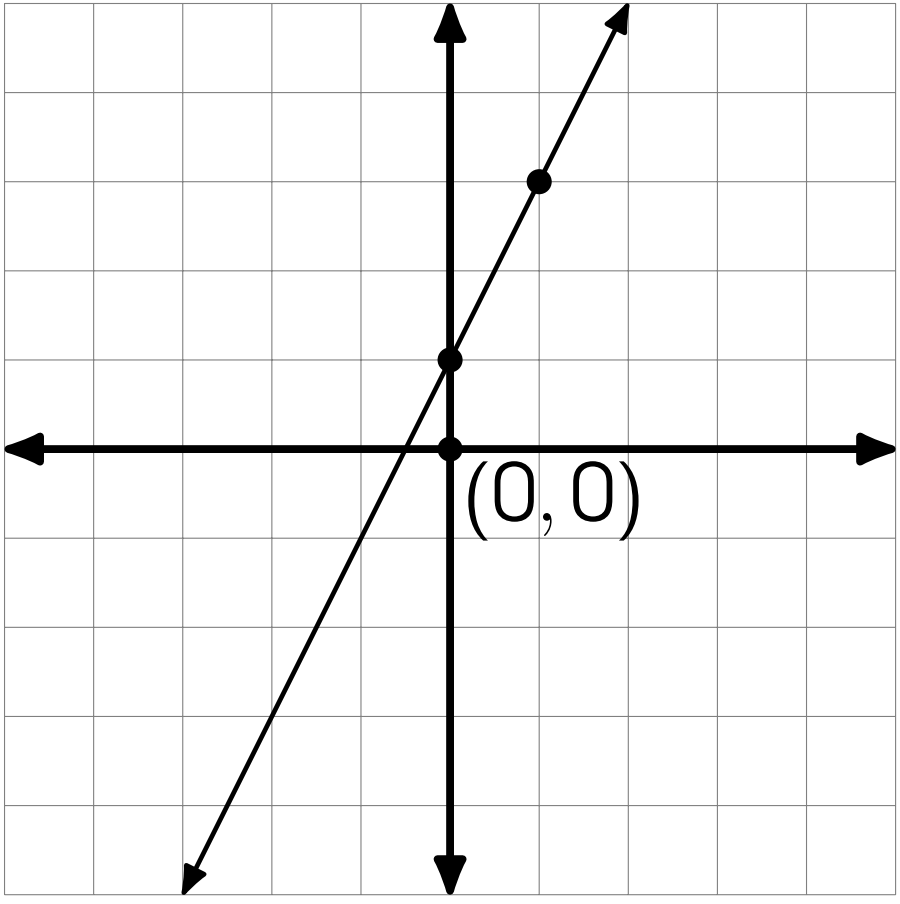

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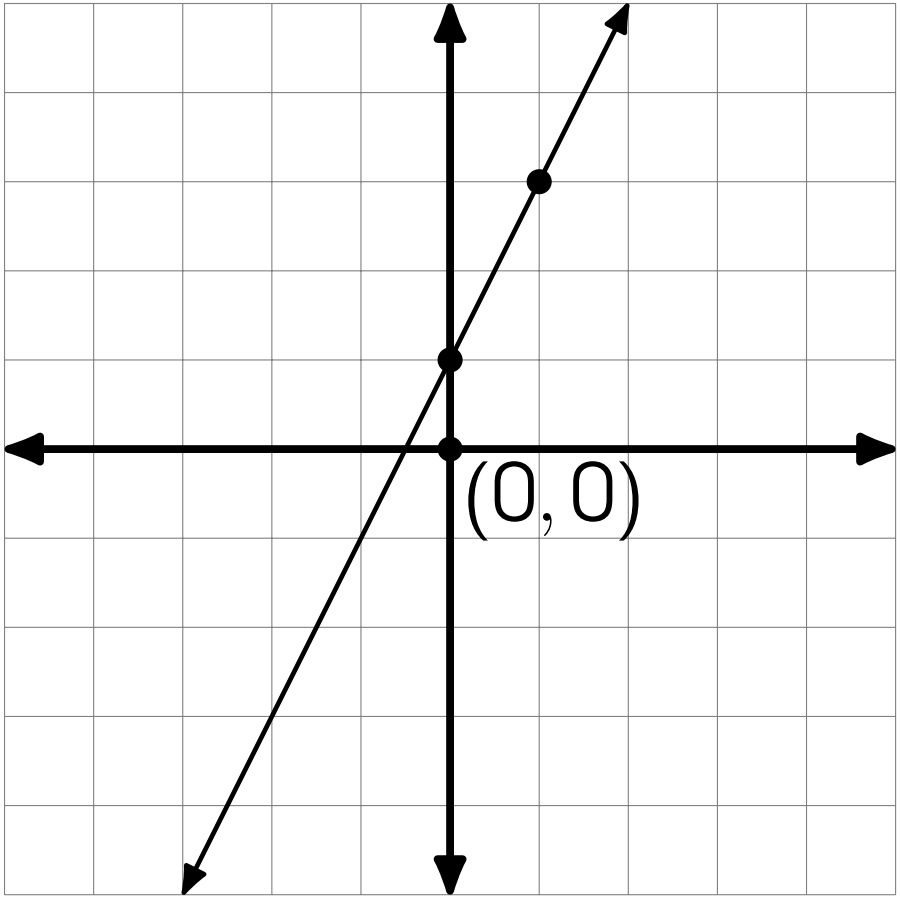

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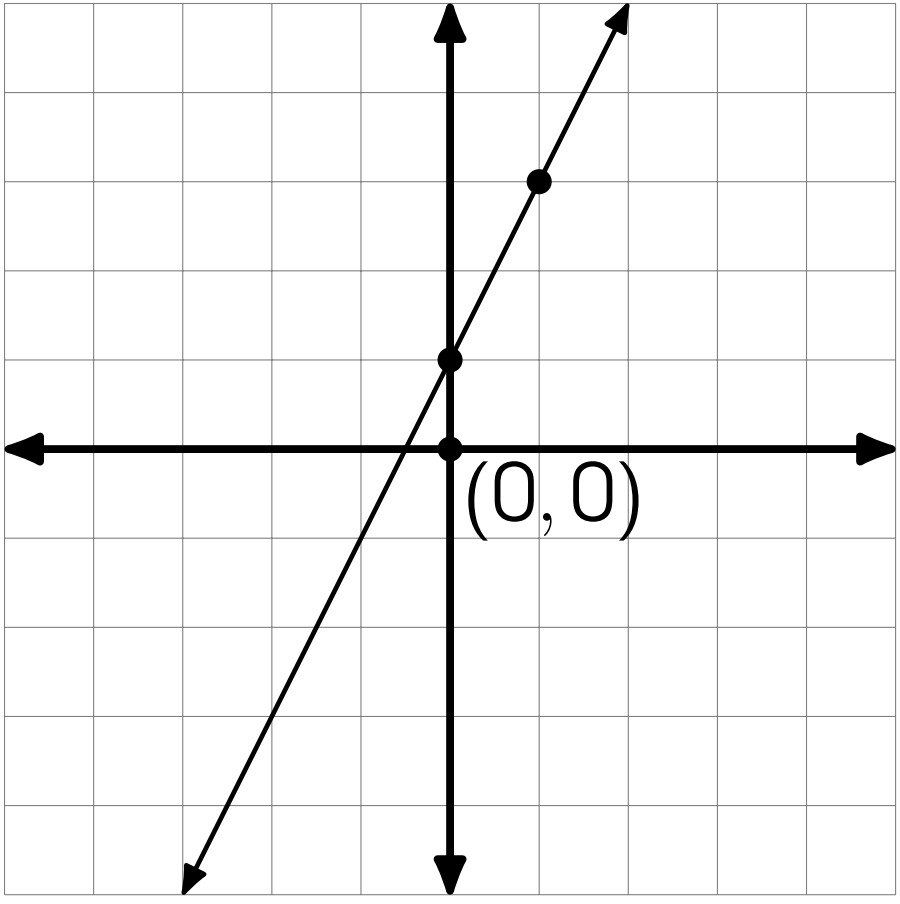

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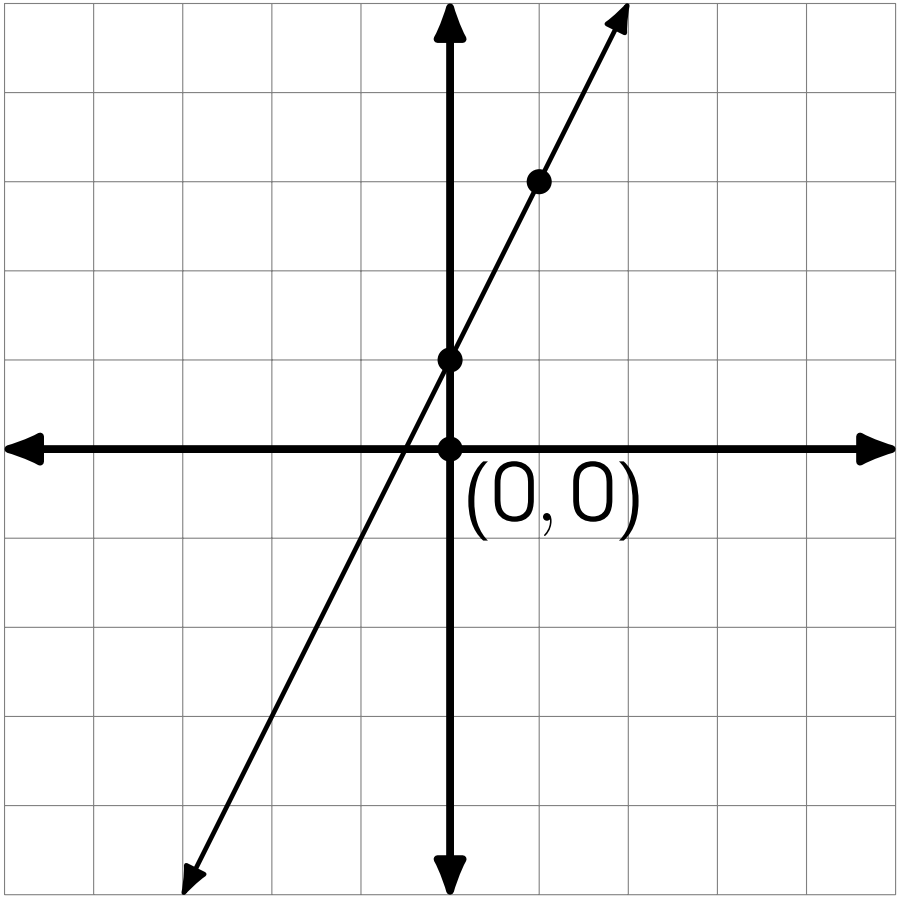

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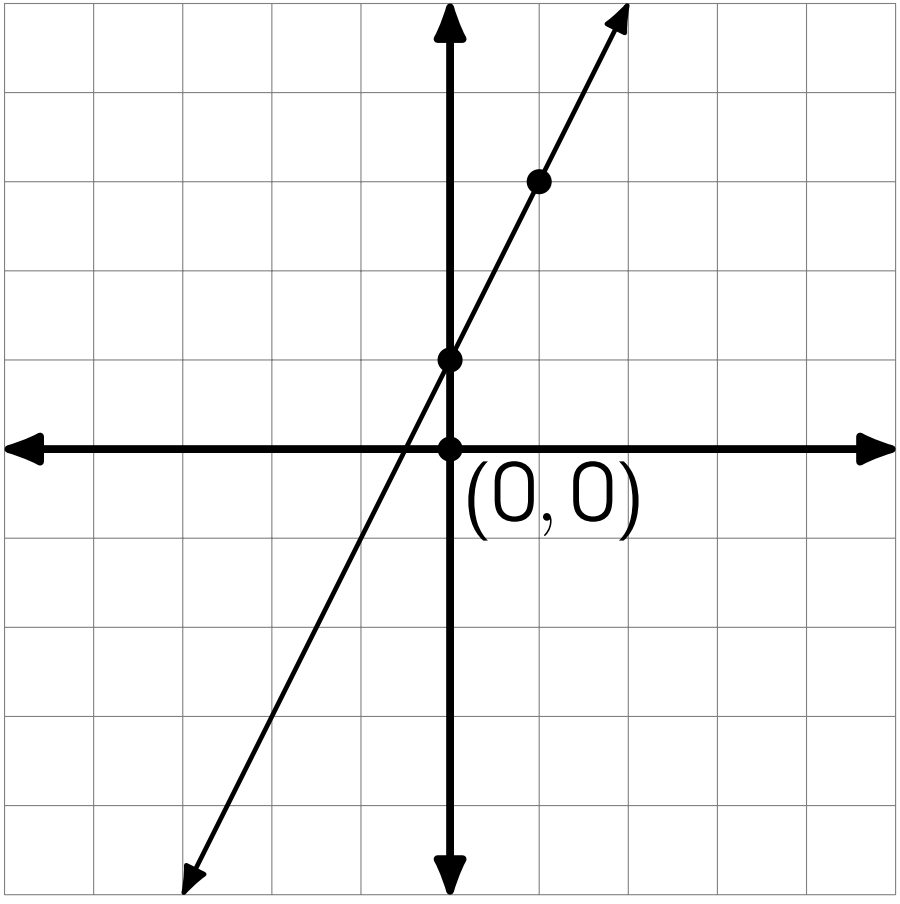

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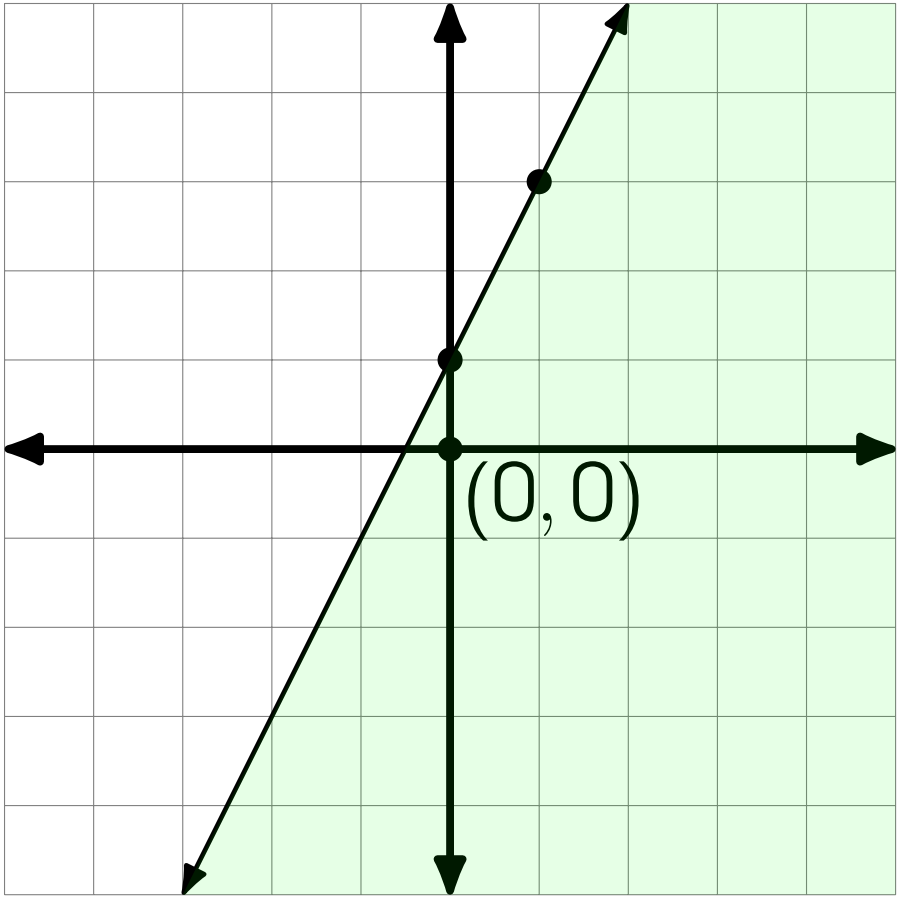

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Example 2

Graph the inequality $x - 2y > -2$.

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Subtraction Property

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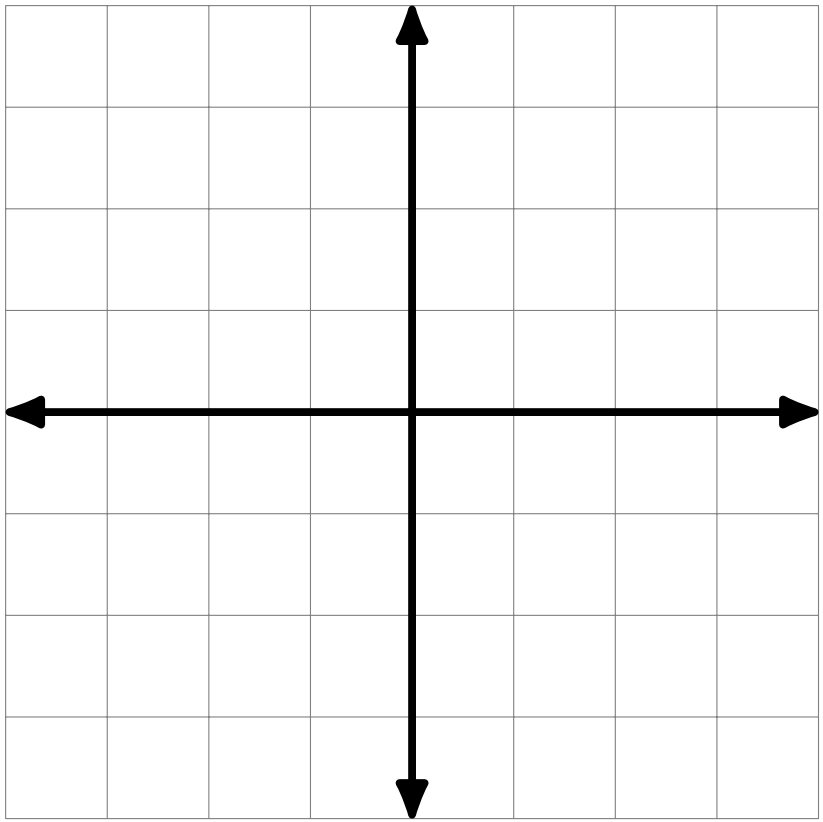

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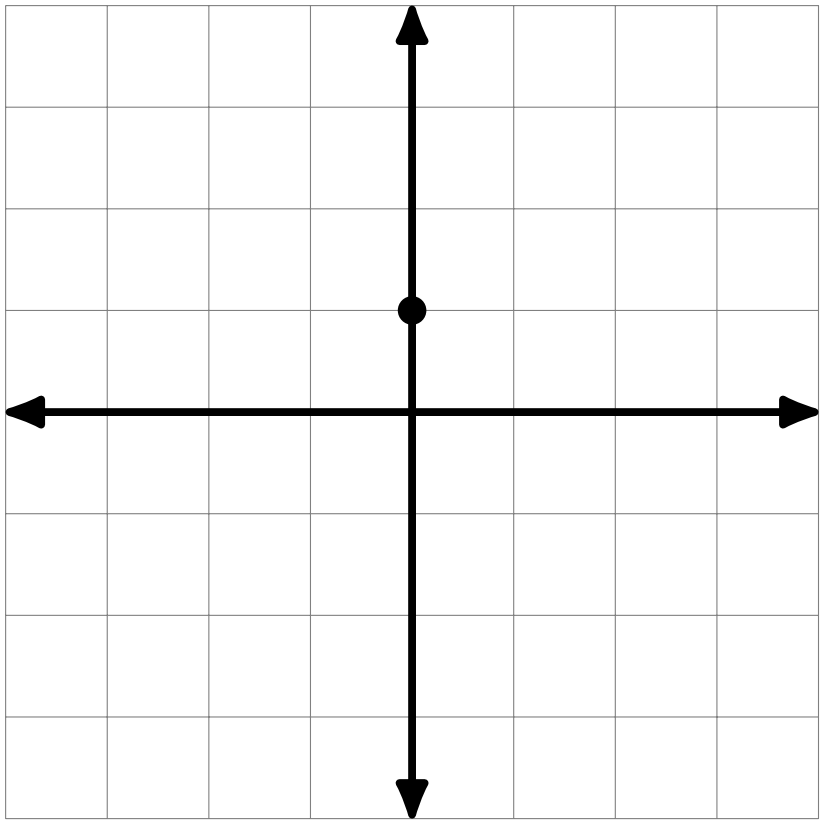

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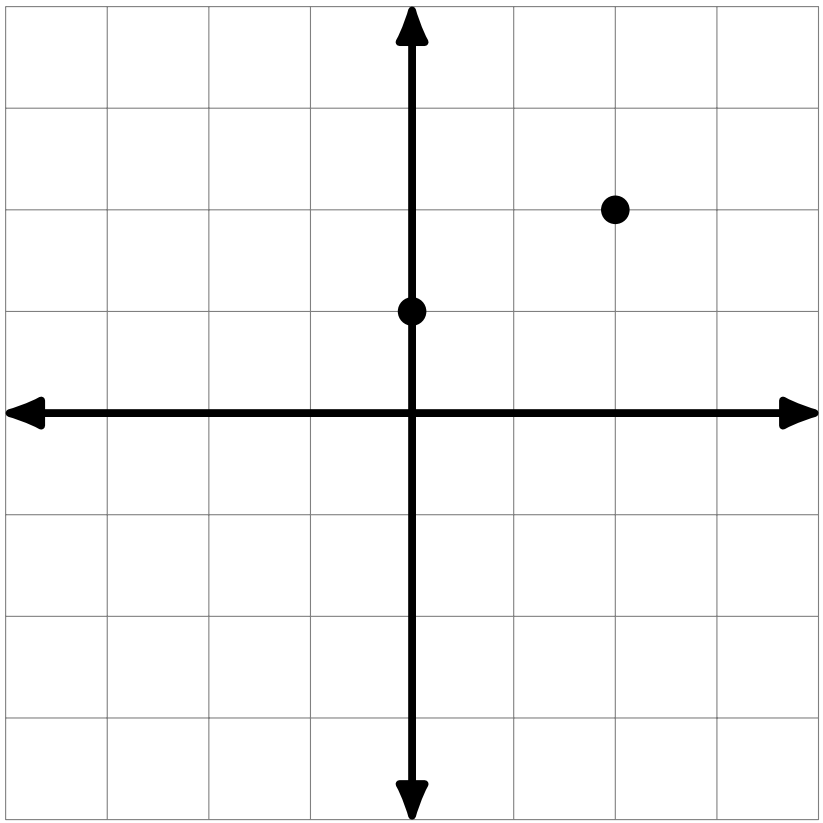

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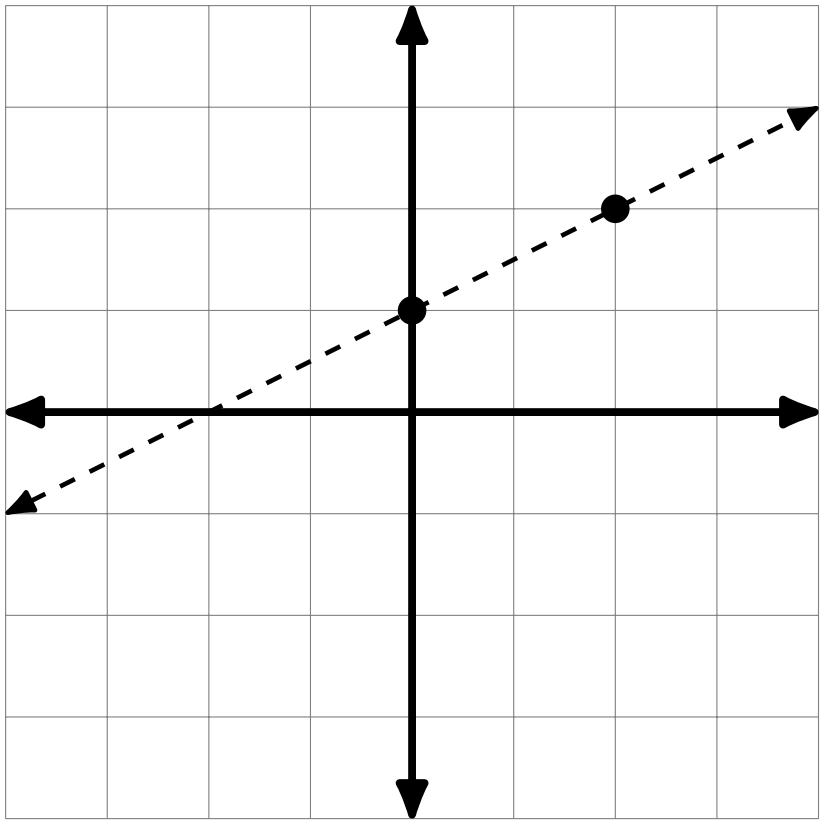

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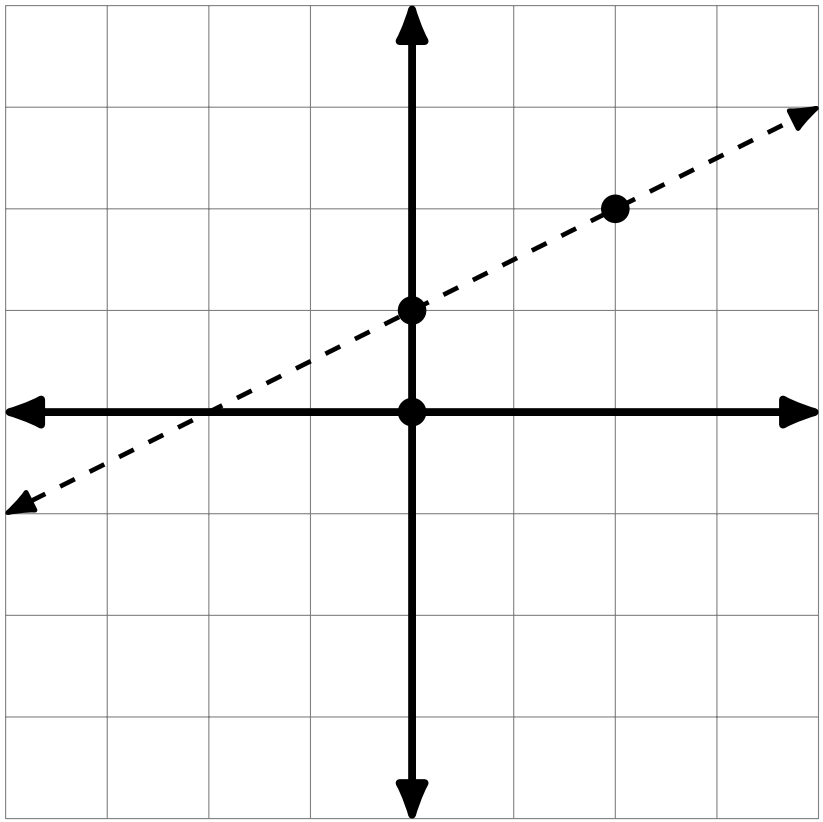

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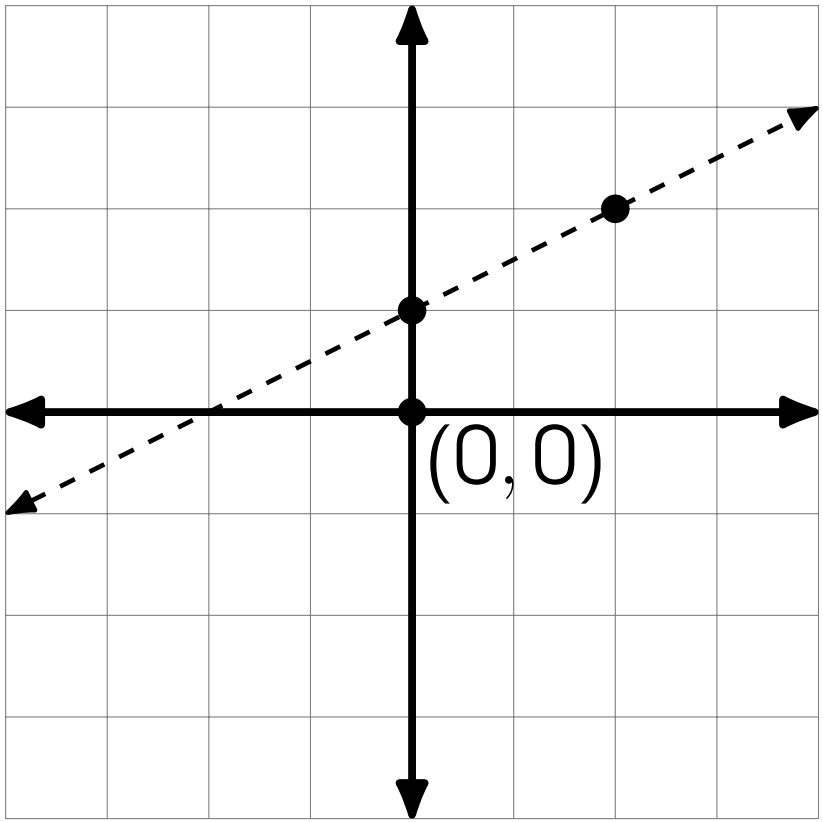

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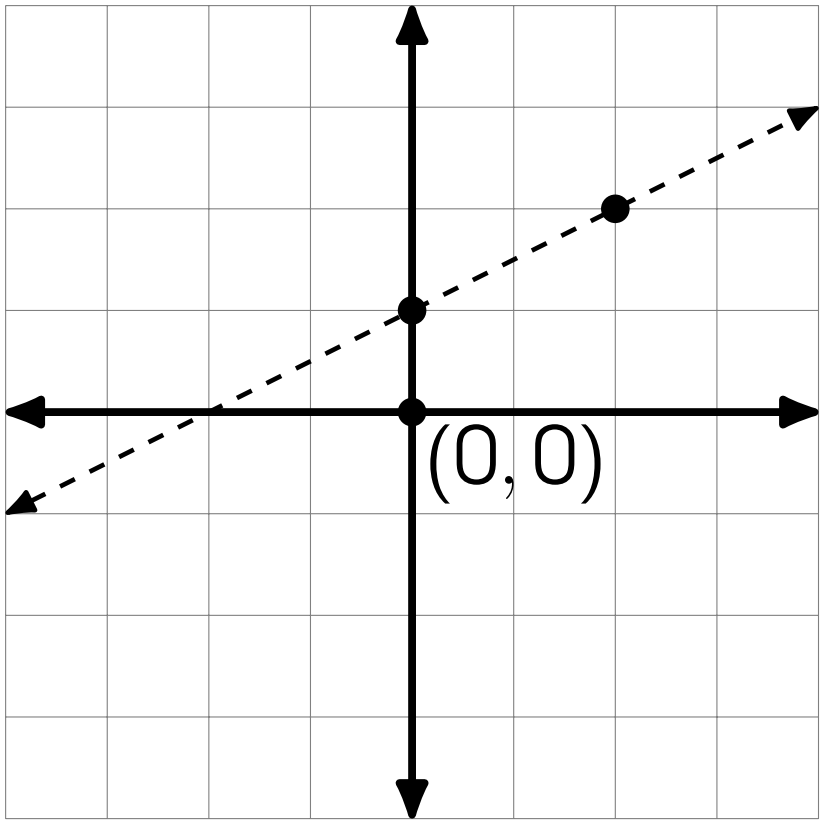

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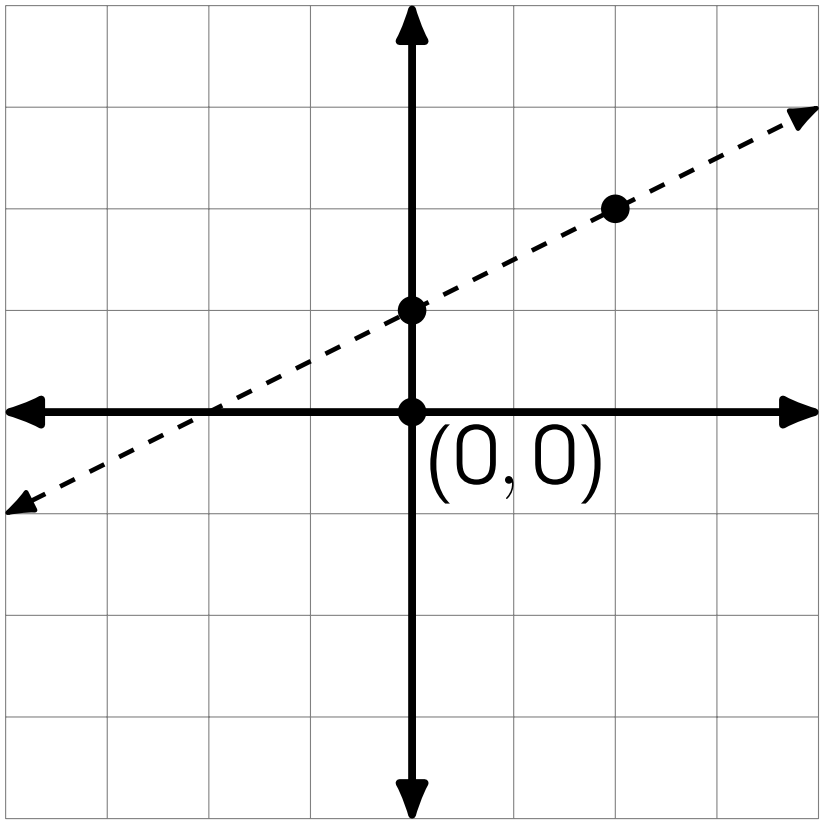

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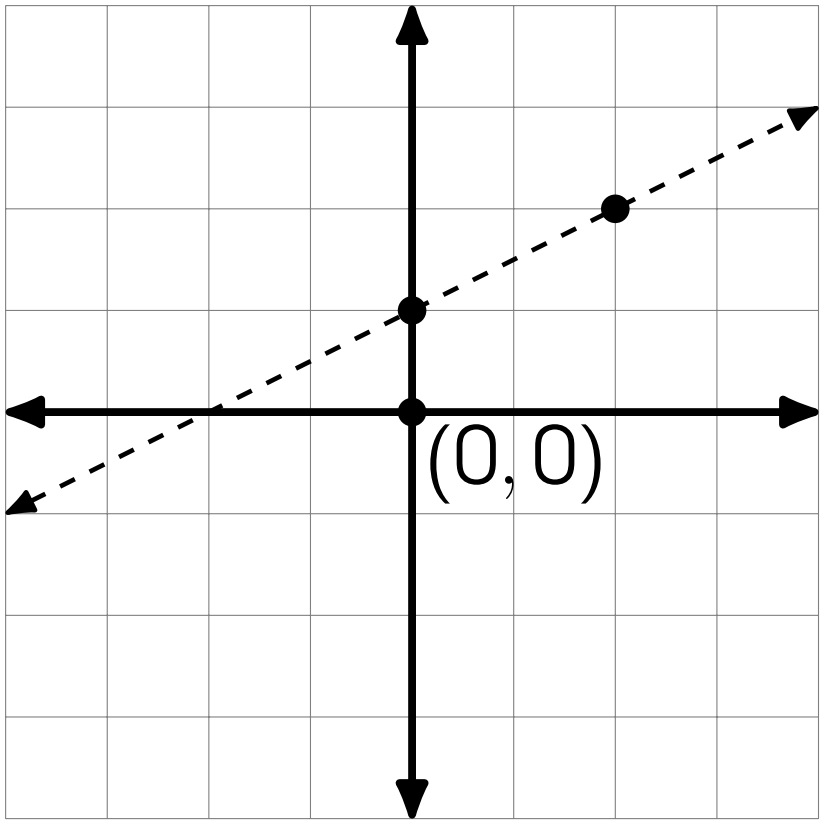

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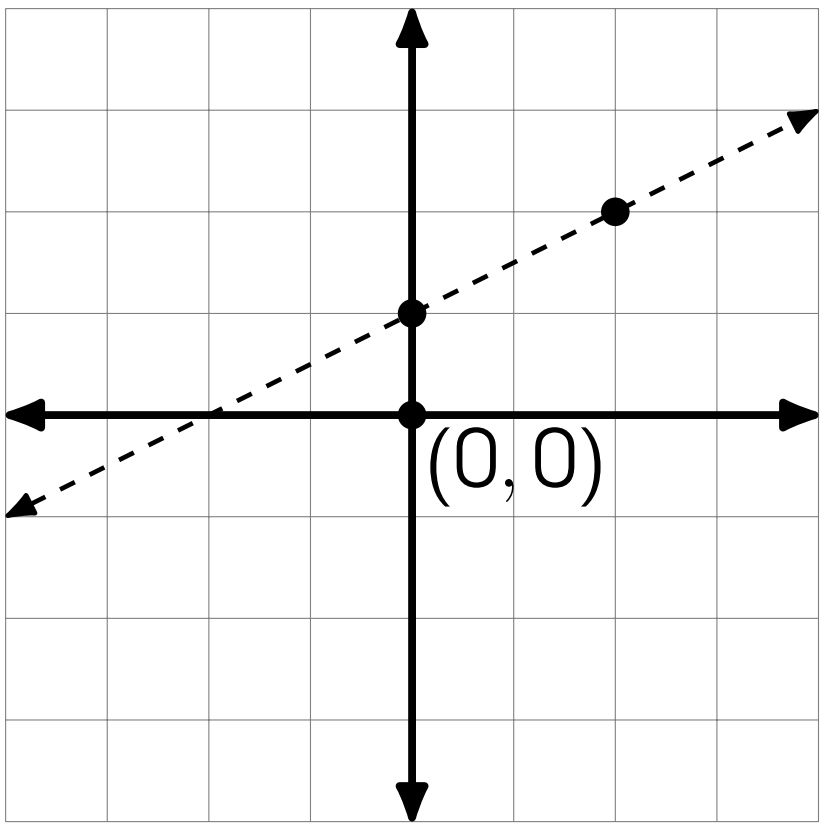

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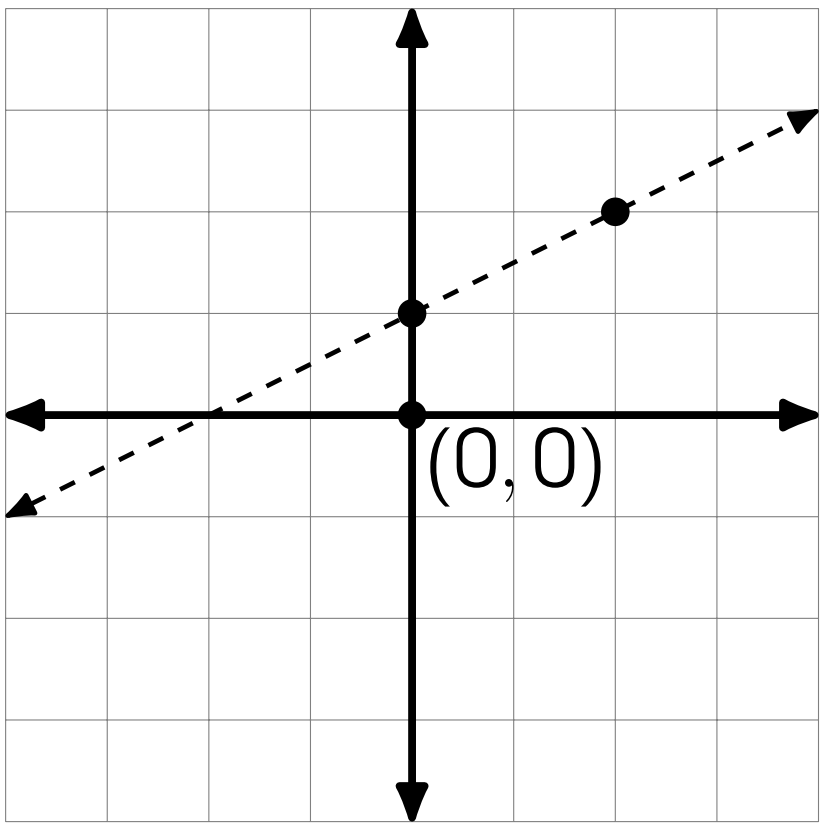

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Step 4: If the inequality is satisfied, shade the region containing that point. If not, shade the other region.

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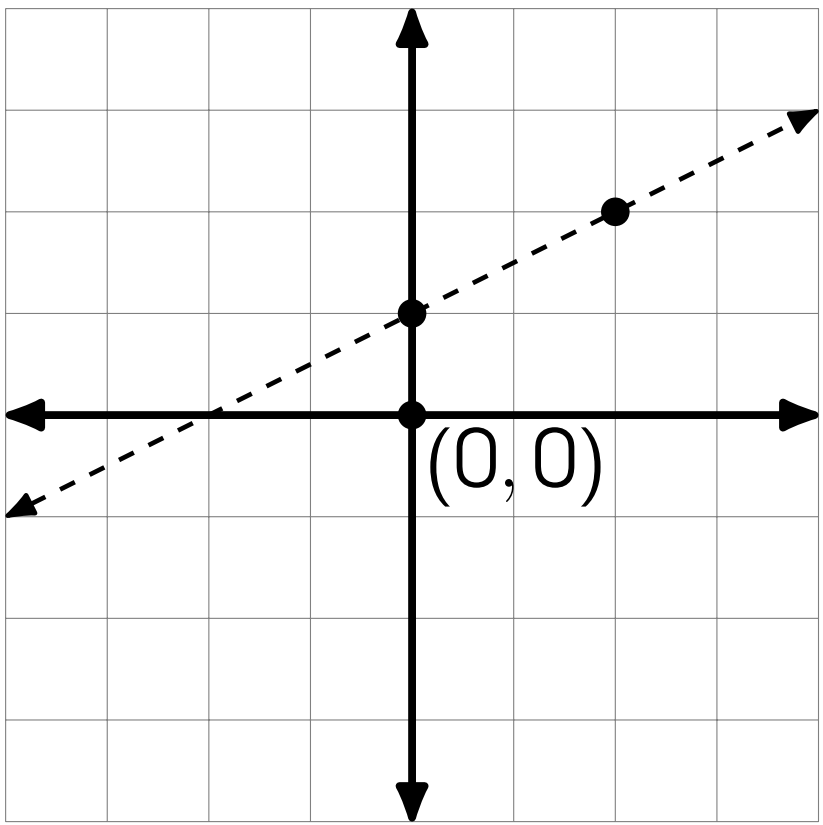

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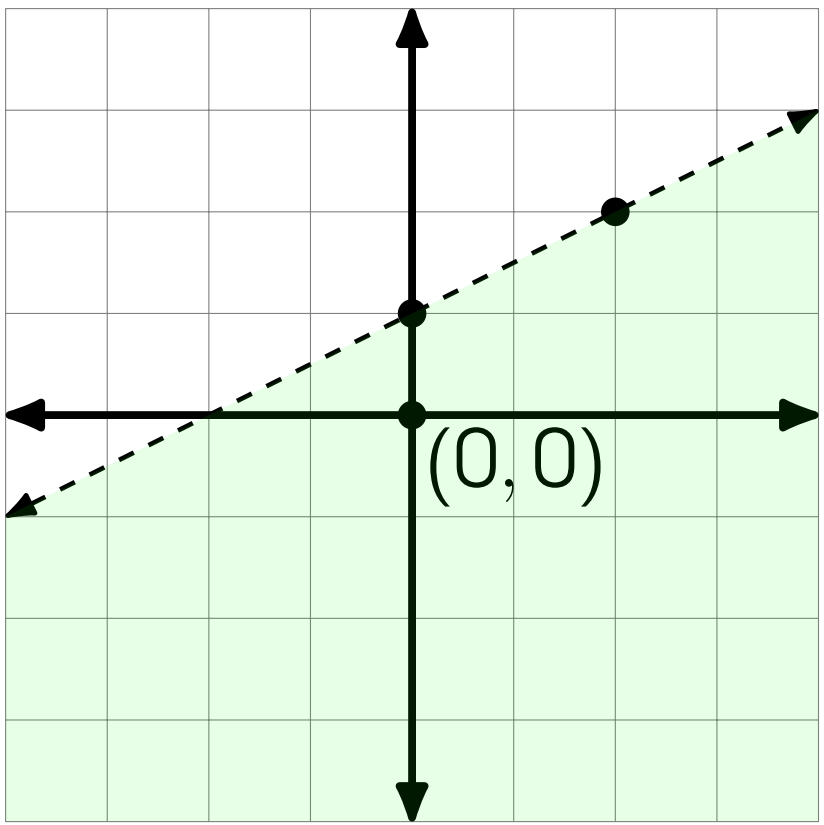

Let $x = 0, y = 0$

$x - 2y > -2$

$0 - 2(0) > -2$

$0 - 0 > -2$

$0 > -2$ ✓

Example 3

Graph the inequality $2x - 2y \geq -8$.

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Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

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Subtraction Property

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Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$

Example 3

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$
Simplification	

Example 3

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$
Simplification	$-2y = -2x - 8$

Example 3

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$
Simplification	$-2y = -2x - 8$

Division Property

Example 3

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$
Simplification	$-2y = -2x - 8$
Division Property	$\frac{-2y}{-2} = \frac{-2x}{-2} - \frac{8}{-2}$

Example 3

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$2x - 2y \geq -8$
Change $\geq$ to $=$	$2x - 2y = -8$
Subtraction Property	$2x - 2x - 2y = -2x - 8$
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Division Property	$\frac{-2y}{-2} = \frac{-2x}{-2} - \frac{8}{-2}$
Simplification	$y = x + 4$
$m = 1$	$b = 4$

Example 3

Step 2: Graph the corresponding equation. Use broken line if the inequality contains $<$ or $>$ symbol or a solid line if inequality contains $\leq$ or $\geq$ symbol.

Original inequality $2x - 2y \geq -8$

Plane divider $y = x + 4$

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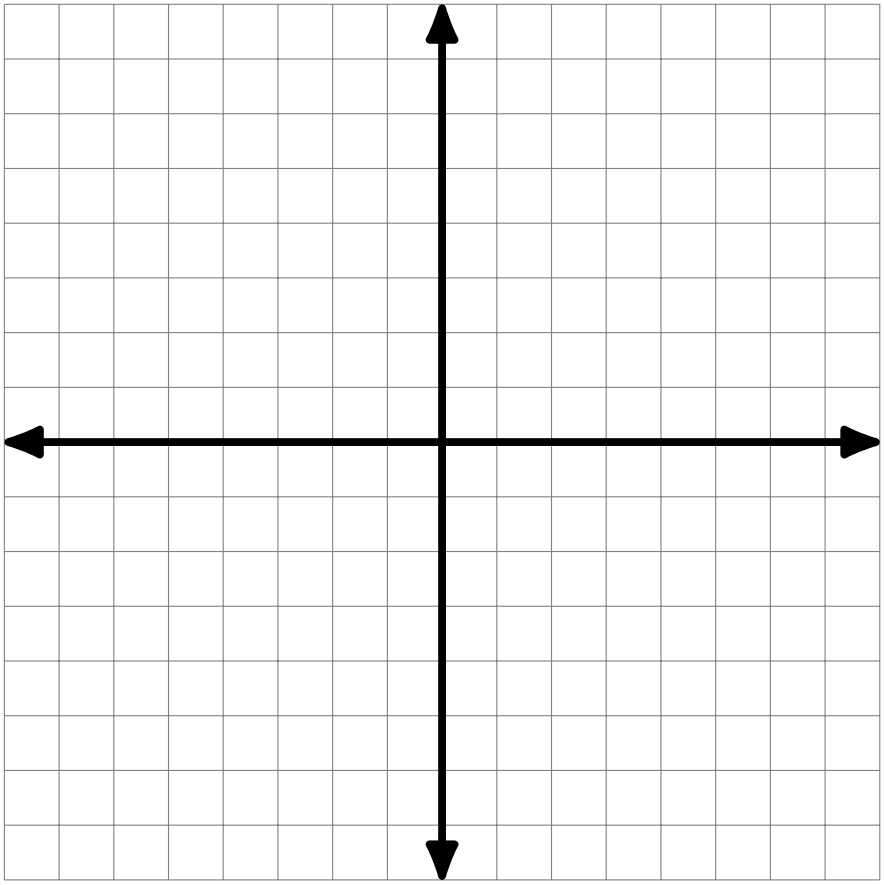

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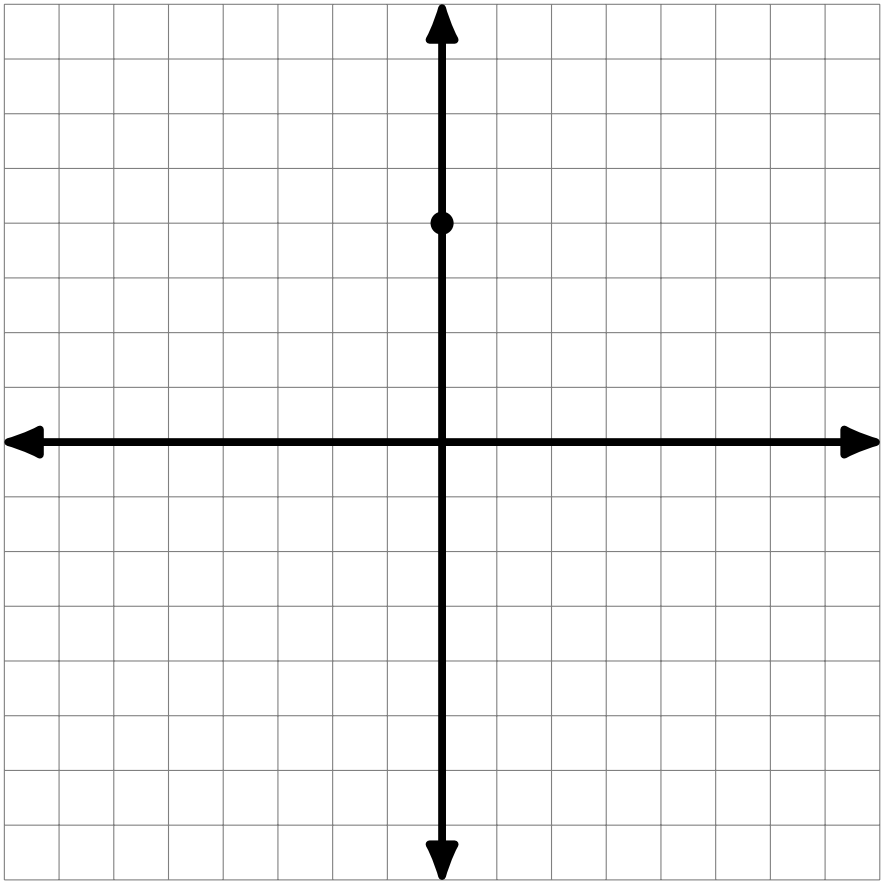

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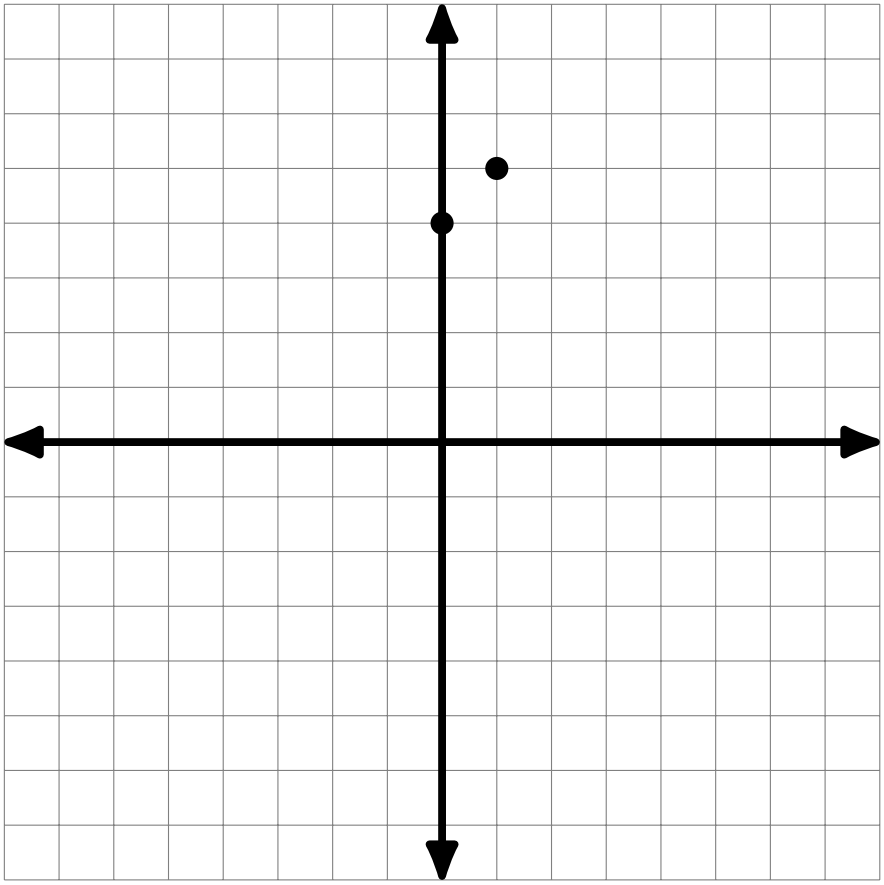


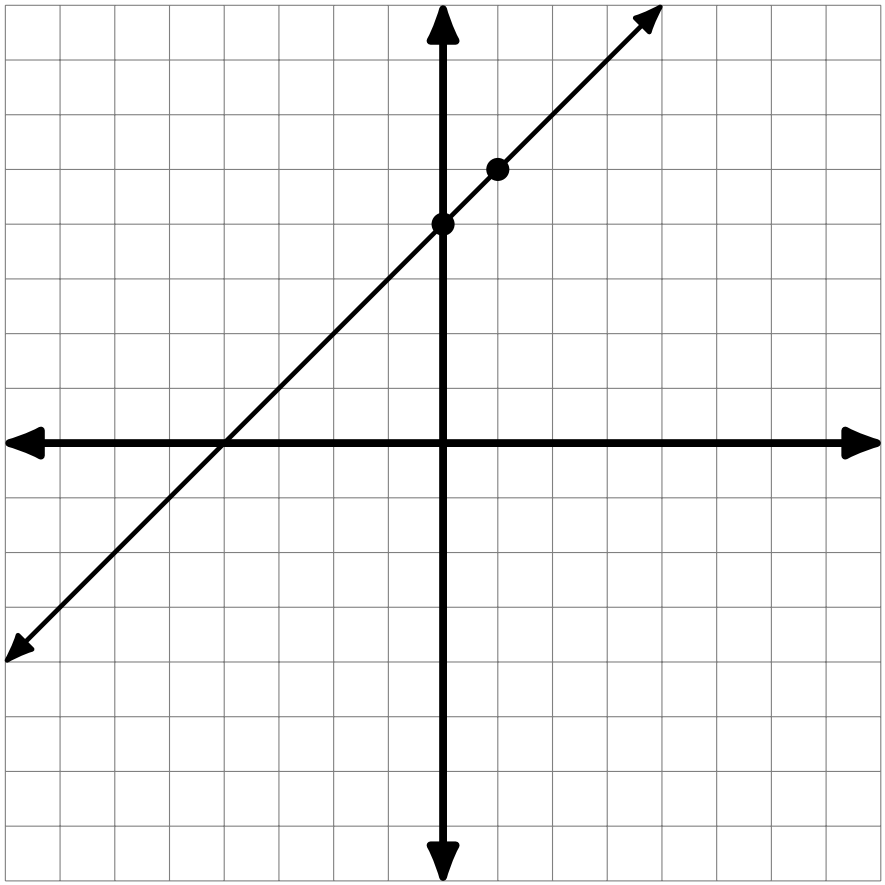
Example 3

Step 3: Choose a point on the plane not on the line and check if its coordinates satisfy the inequality.

Original inequality $2x - 2y \geq -8$

Plane divider $y = x + 4$

$m = 1$ $b = 4$



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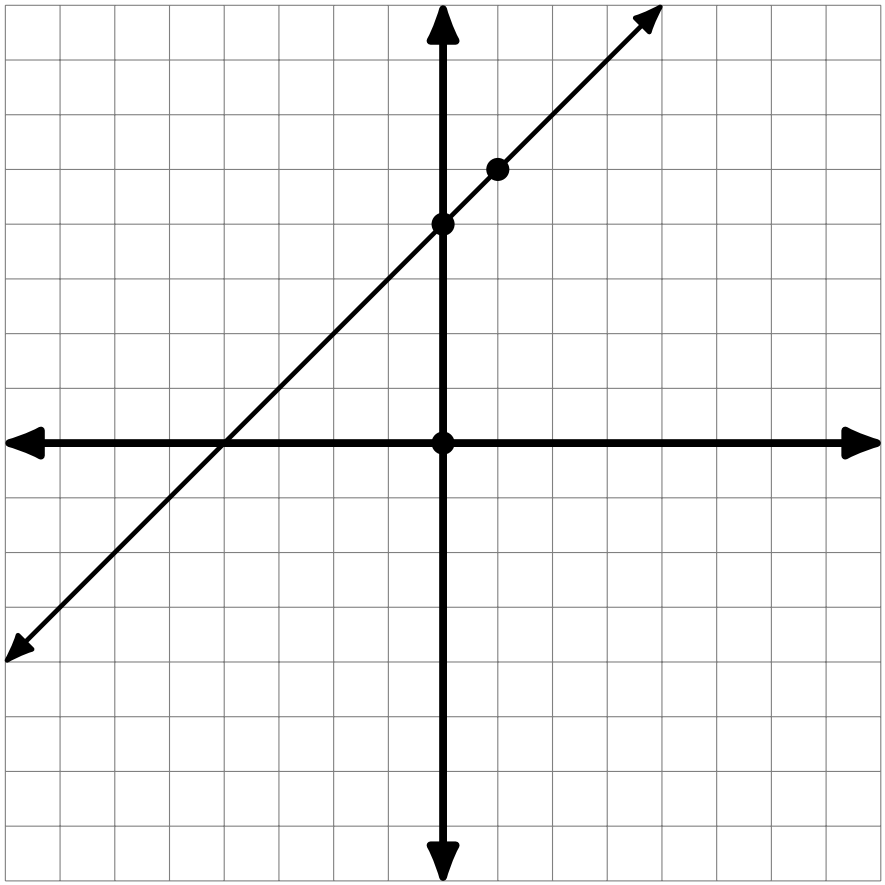

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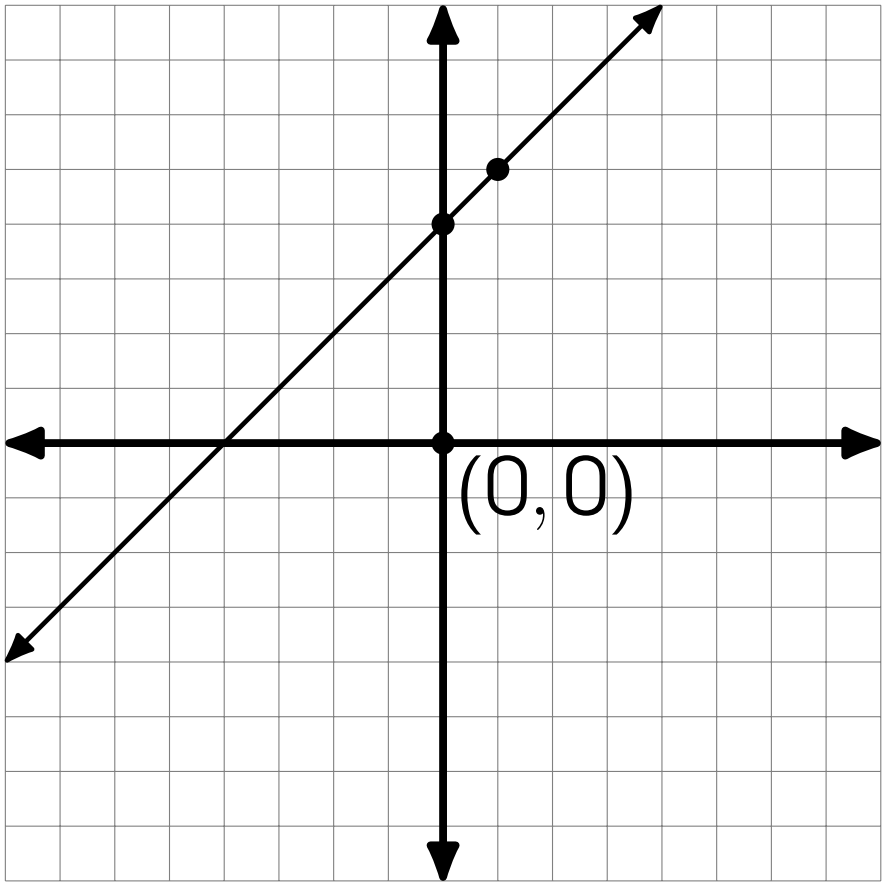

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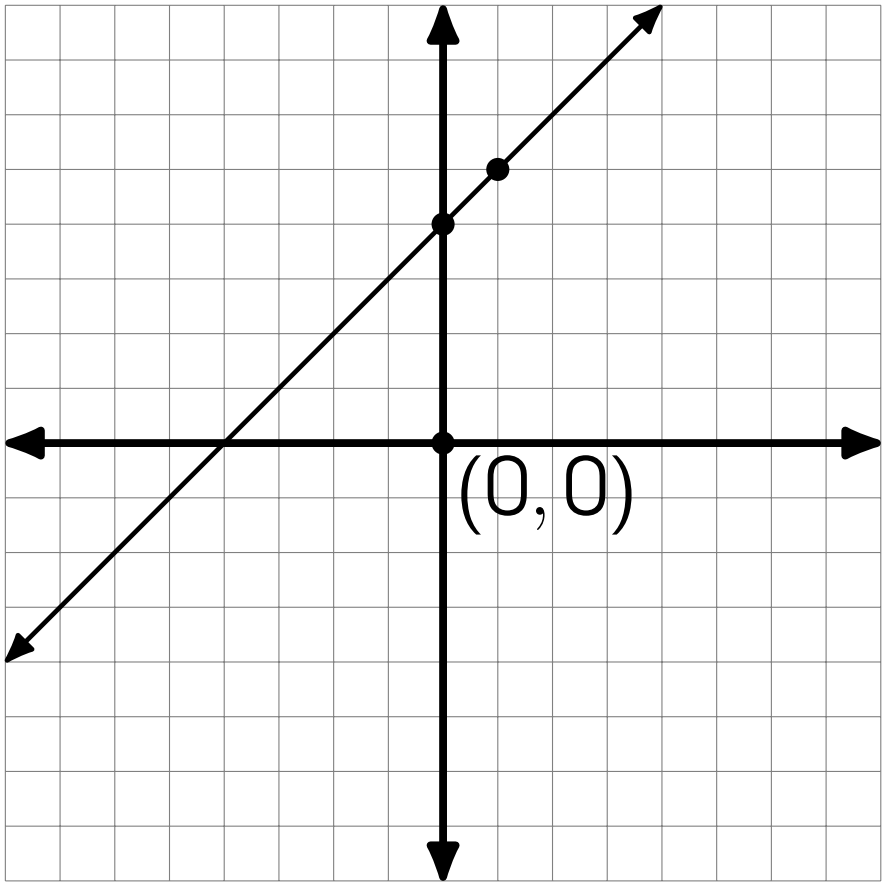

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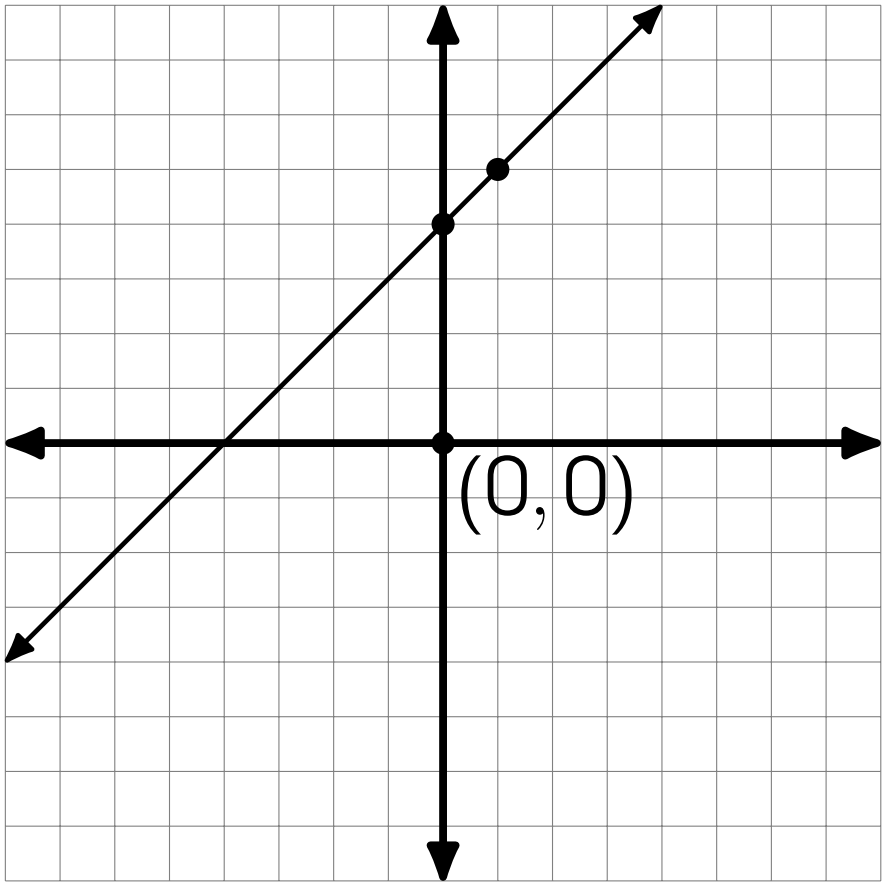

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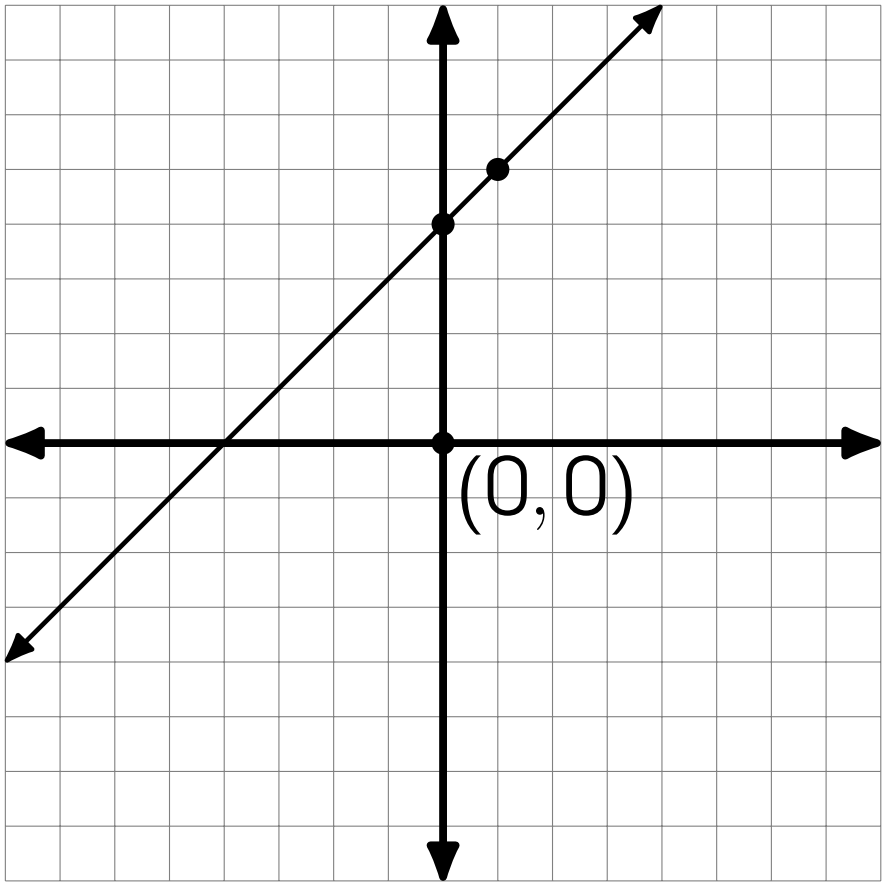

Let $x = 0, y = 0$

$2x - 2y \geq -8$

$2(0) - 2(0) \geq -8$

Example 3

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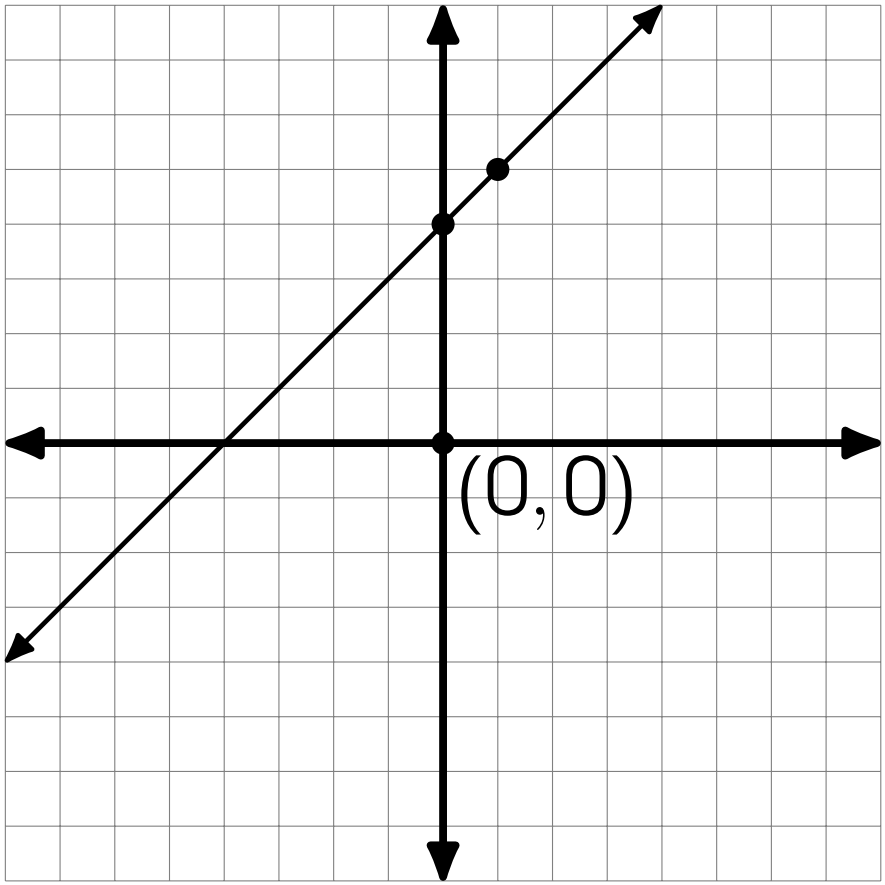

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$2x - 2y \geq -8$

$2(0) - 2(0) \geq -8$

$0 - 0 \geq -8$

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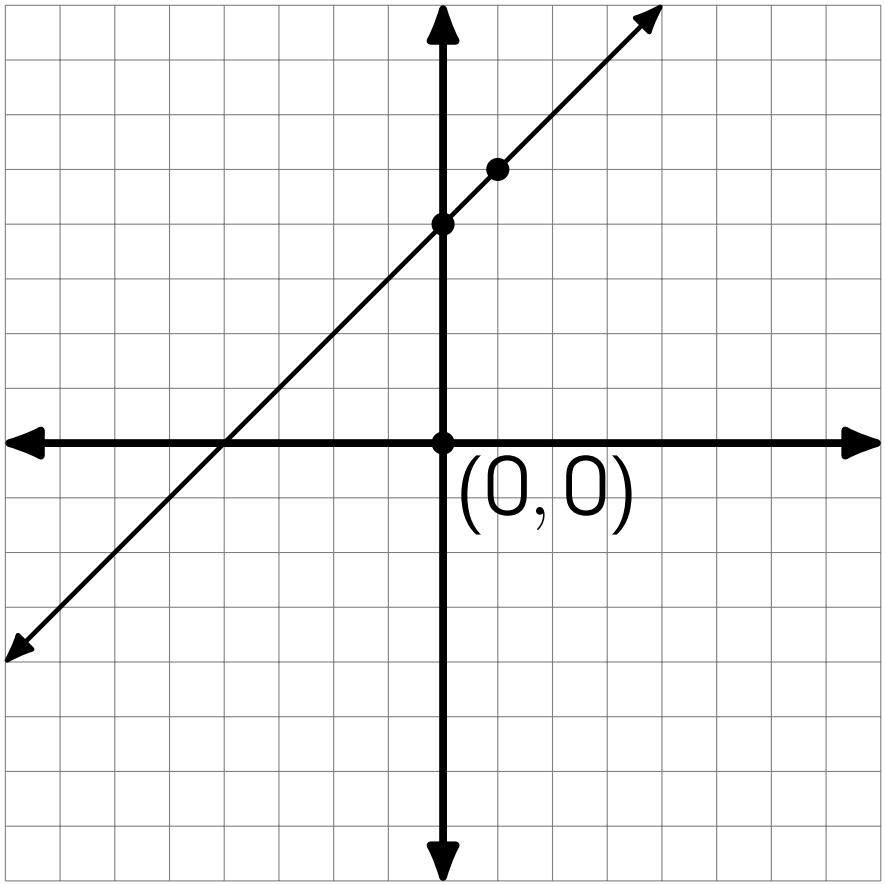

Let $x = 0, y = 0$

$2x - 2y \geq -8$

$2(0) - 2(0) \geq -8$

$0 - 0 \geq -8$

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Example 3

Step 4: If the inequality is satisfied, shade the region containing that point. If not, shade the other region.

Original inequality $2x - 2y \geq -8$

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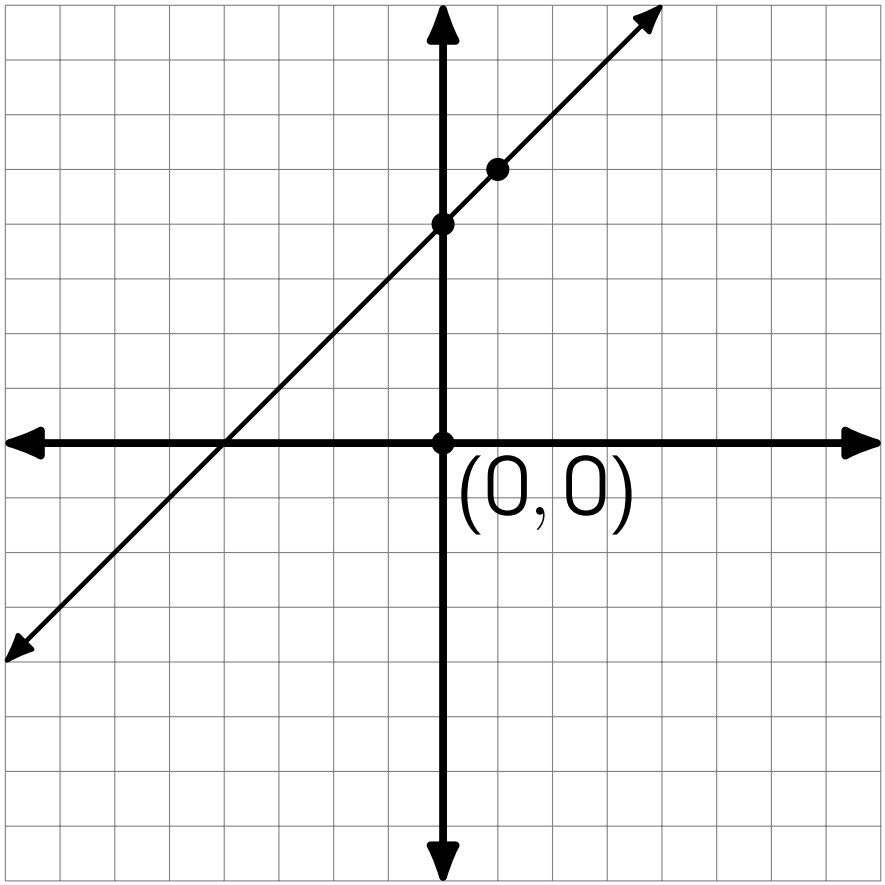

Let $x = 0, y = 0$

$2x - 2y \geq -8$

$2(0) - 2(0) \geq -8$

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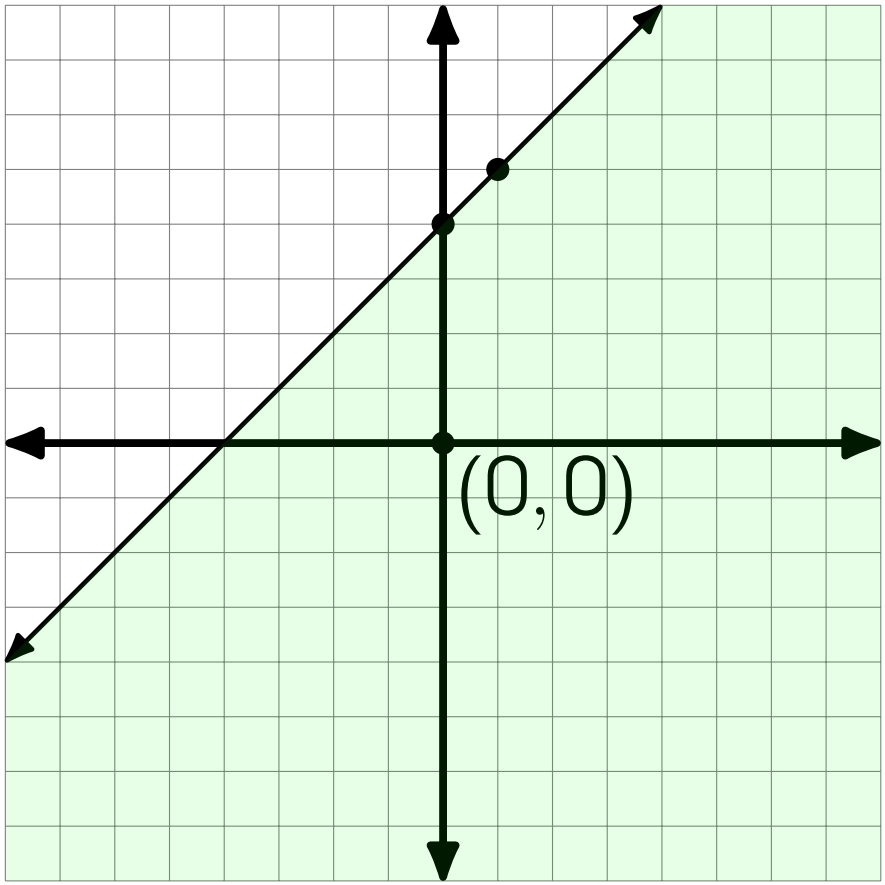

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$2x - 2y \geq -8$

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$0 \geq -8$ ✓

Example 4

Graph the inequality $-3x + y < -2$.

Example 4

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

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Addition Property

Example 4

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$-3x + y < -2$
Change $<$ to $=$	$-3x + y = -2$
Addition Property	$-3x + 3x + y = 3x - 2$

Example 4

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$-3x + y < -2$
Change $<$ to $=$	$-3x + y = -2$
Addition Property	$-3x + 3x + y = 3x - 2$
Simplification	

Example 4

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$-3x + y < -2$
Change $<$ to $=$	$-3x + y = -2$
Addition Property	$-3x + 3x + y = 3x - 2$
Simplification	$y = 3x - 2$

Example 4

Step 1: Replace the inequality symbol with an equal sign. The resulting equation becomes the plane divider.

Original inequality	$-3x + y < -2$
Change $<$ to $=$	$-3x + y = -2$
Addition Property	$-3x + 3x + y = 3x - 2$
Simplification	$y = 3x - 2$
$m = 3$	$b = -2$

Example 4

Step 2: Graph the corresponding equation. Use broken line if the inequality contains $<$ or $>$ symbol or a solid line if inequality contains $\leq$ or $\geq$ symbol.

Original inequality $-3x + y < -2$

Plane divider $y = 3x - 2$

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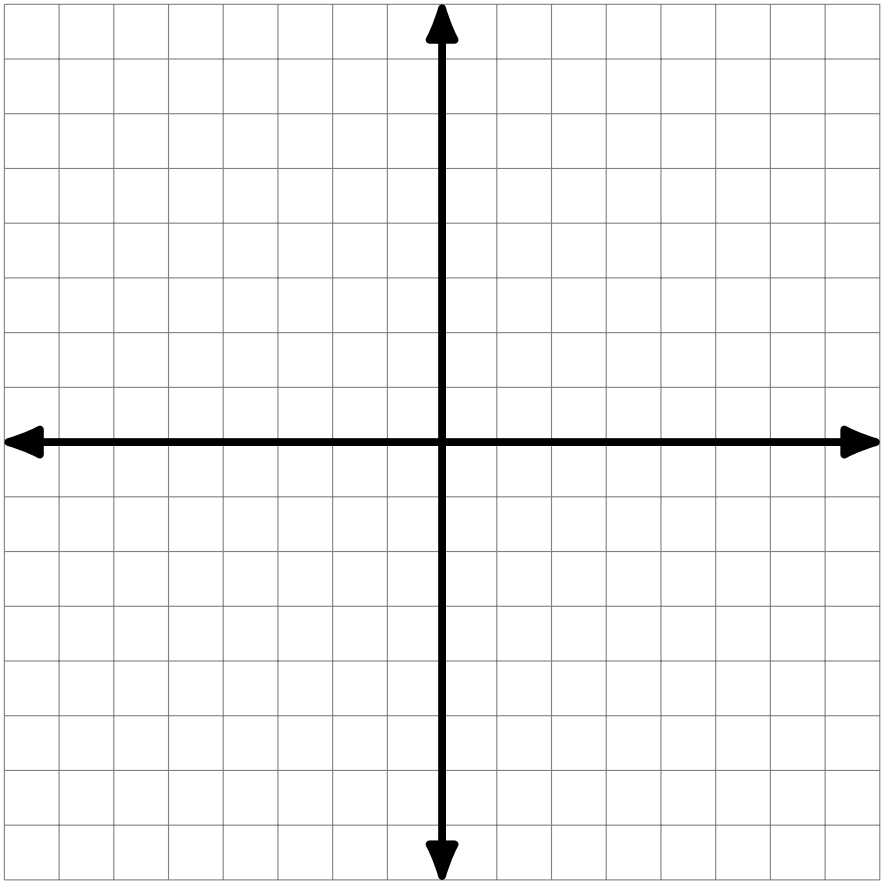

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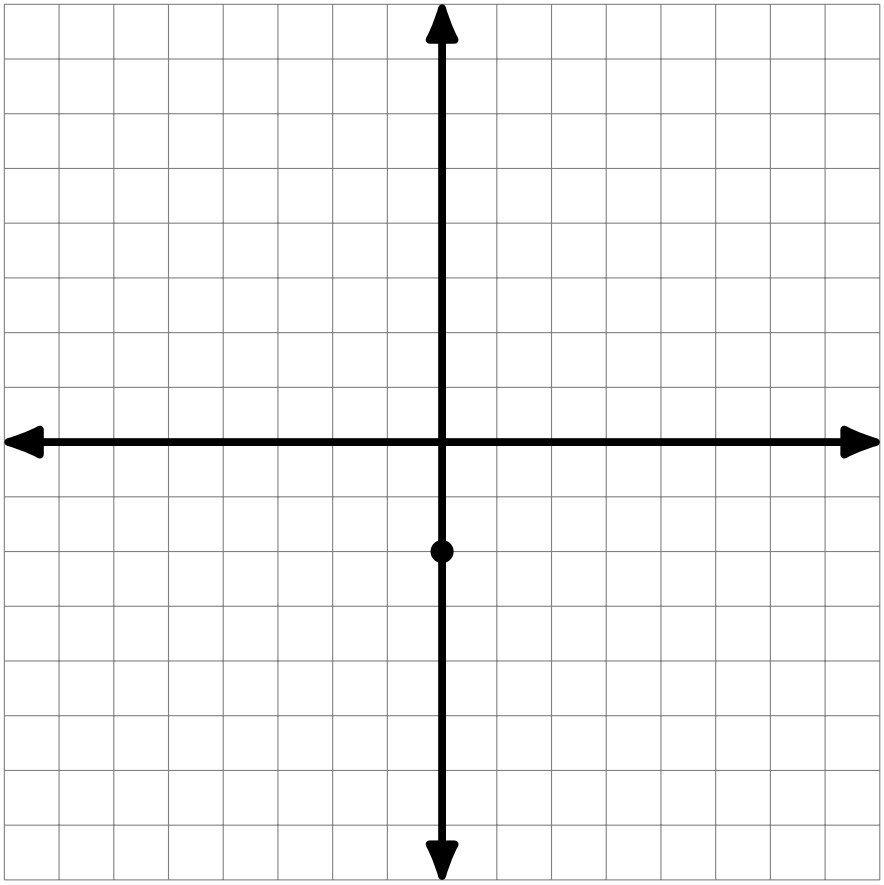

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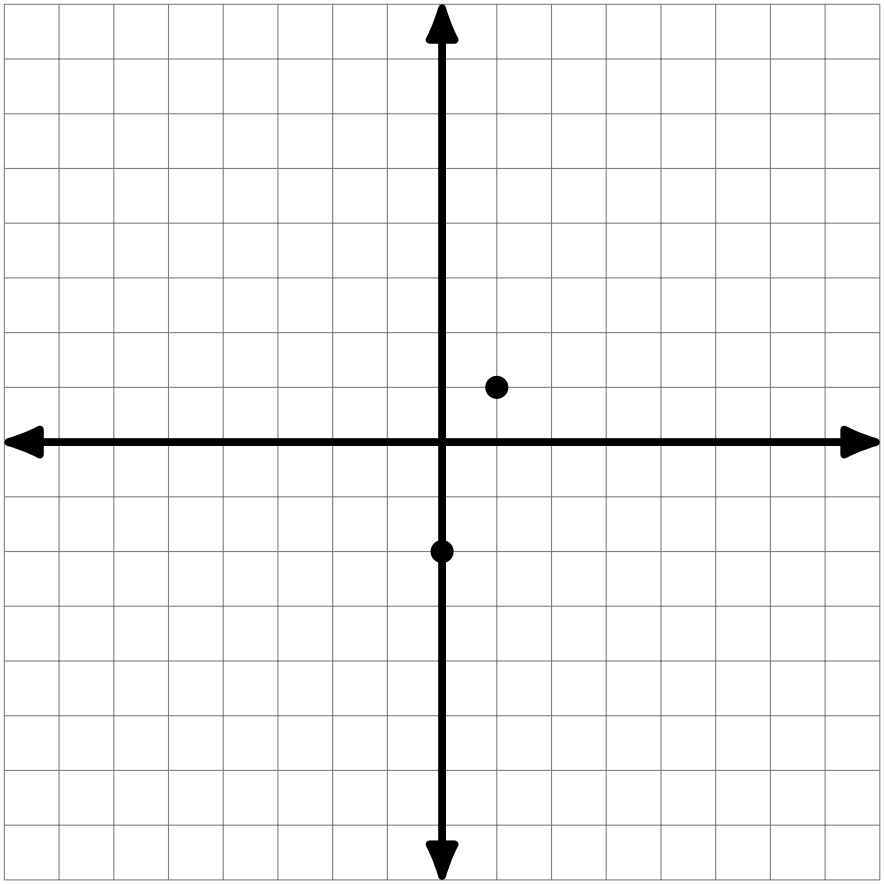


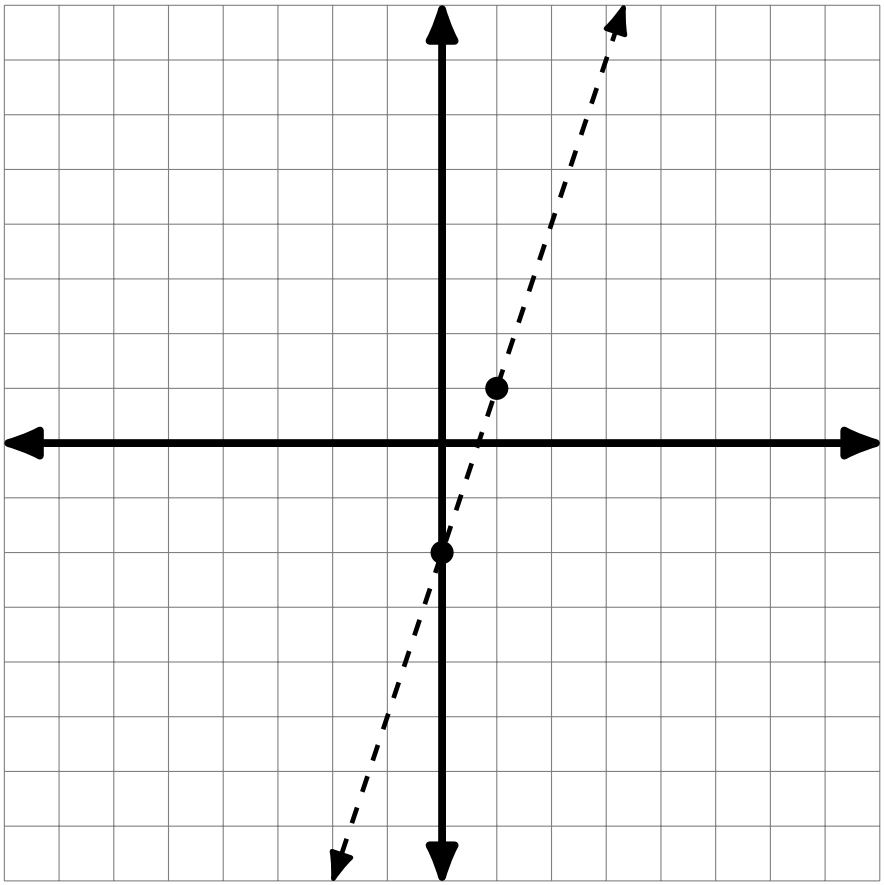
Example 4

Step 3: Choose a point on the plane not on the line and check if its coordinates satisfy the inequality.

Original inequality $-3x + y < -2$

Plane divider $y = 3x - 2$

$m = 3$ $b = -2$



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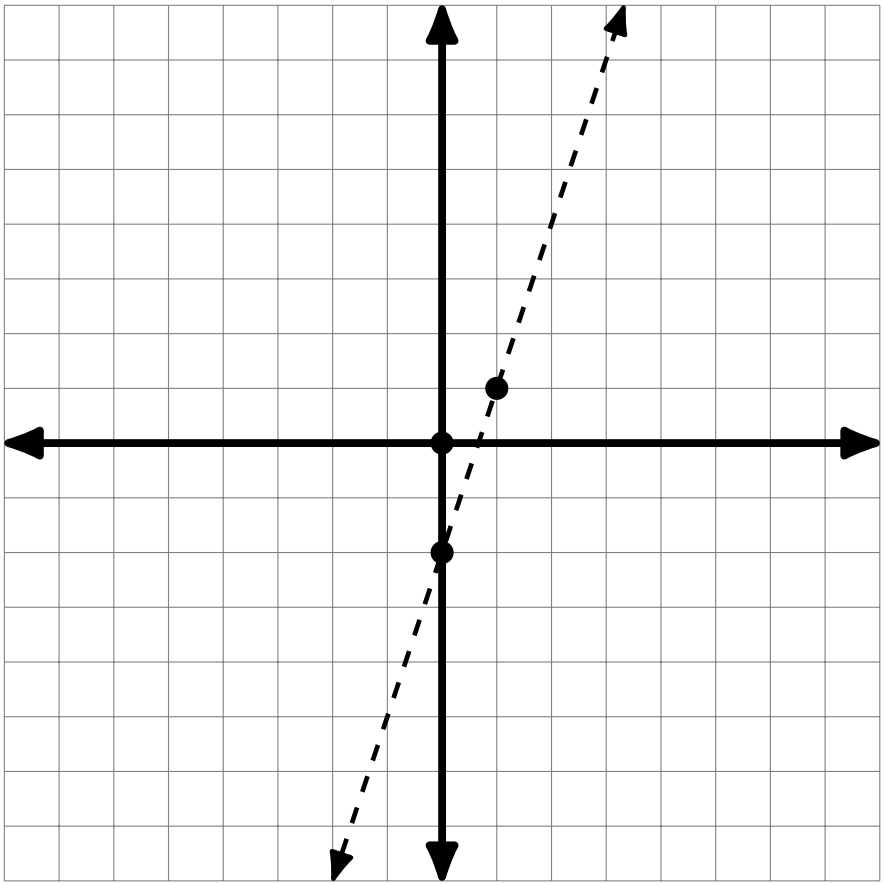

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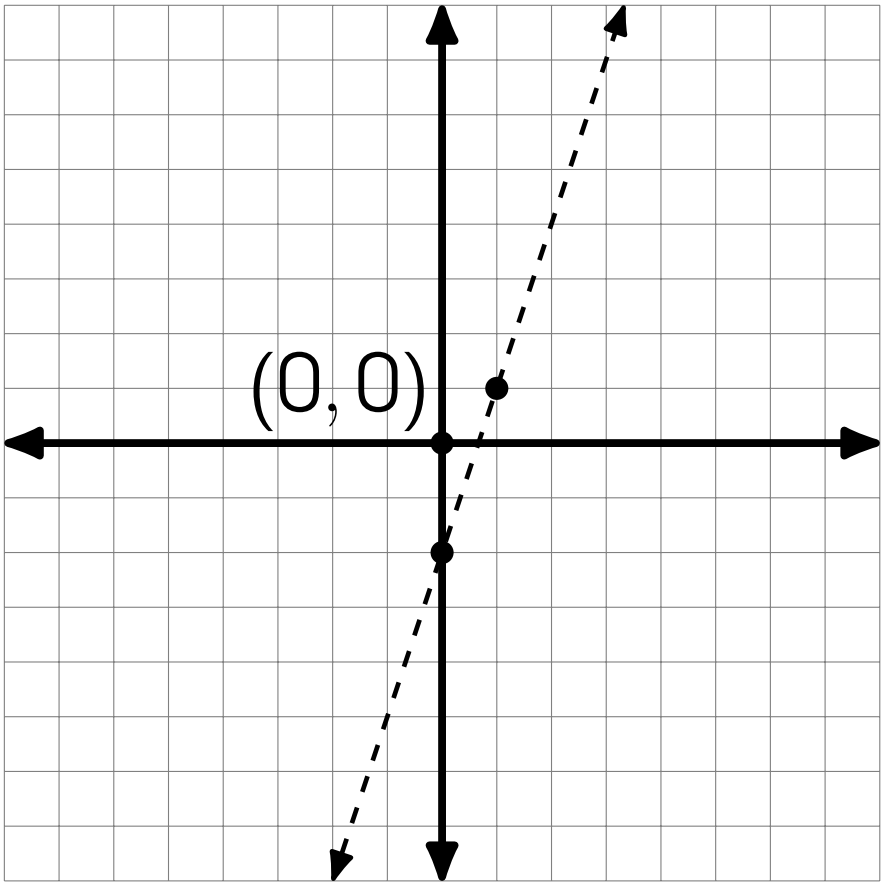

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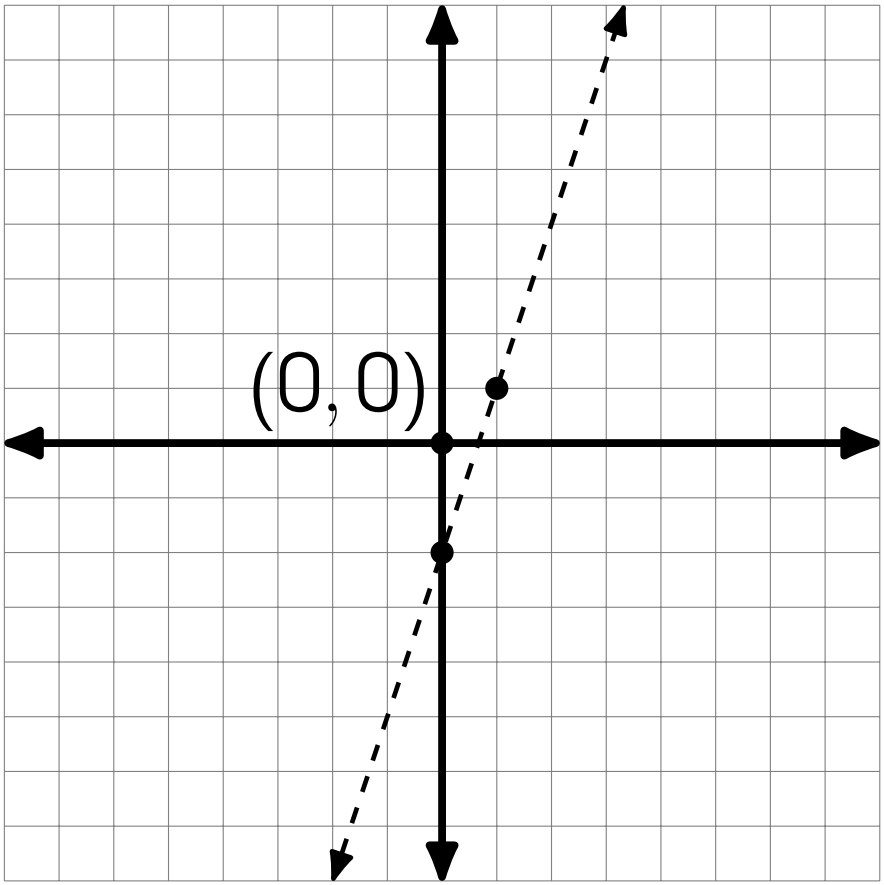

Let $x = 0, y = 0$

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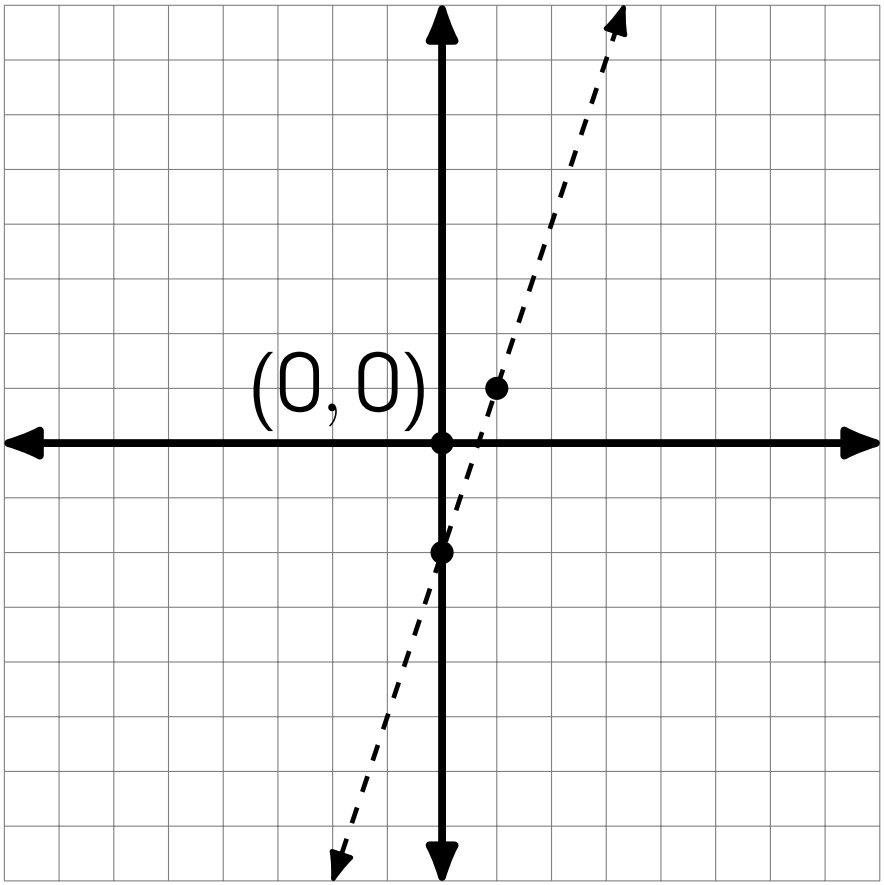

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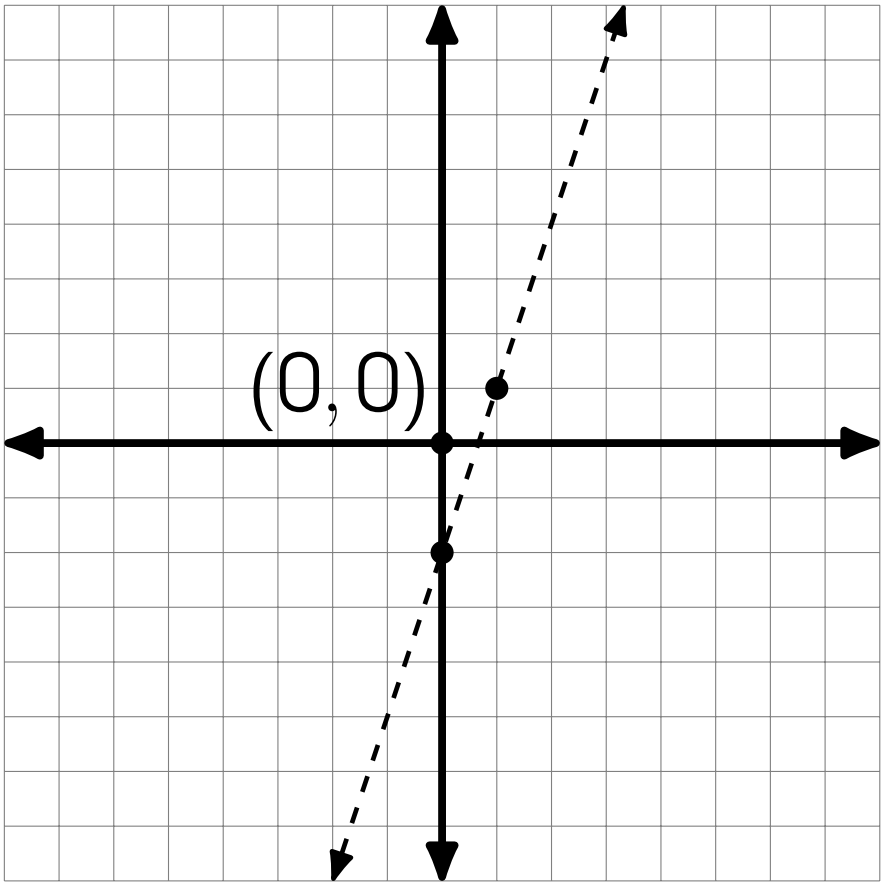

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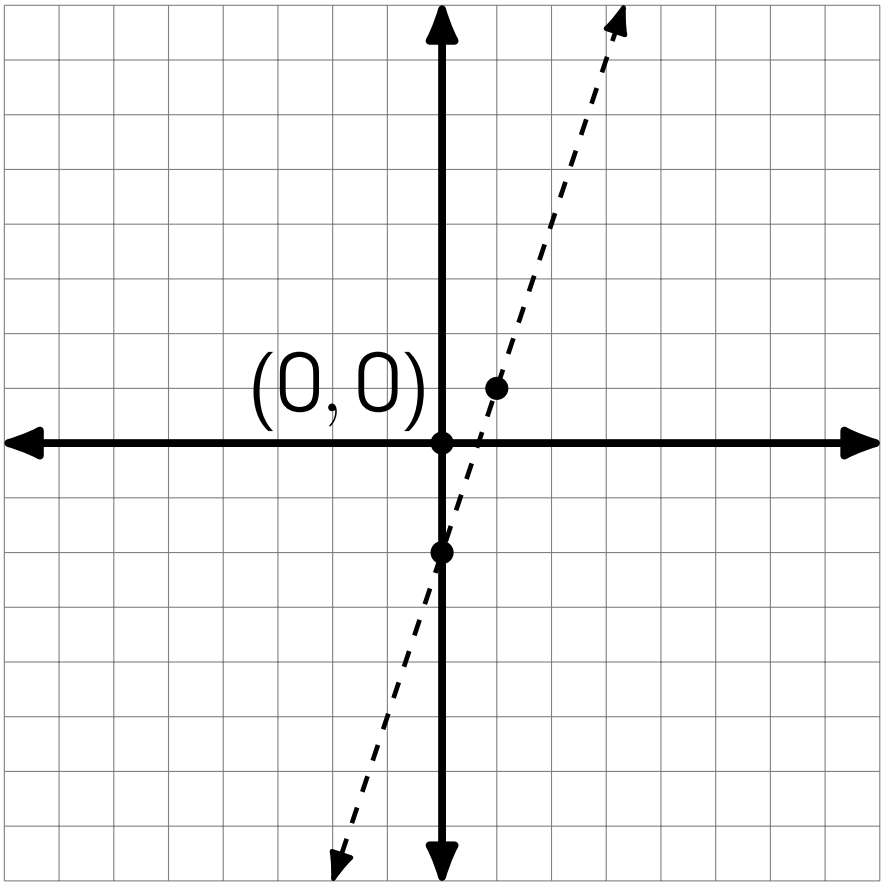

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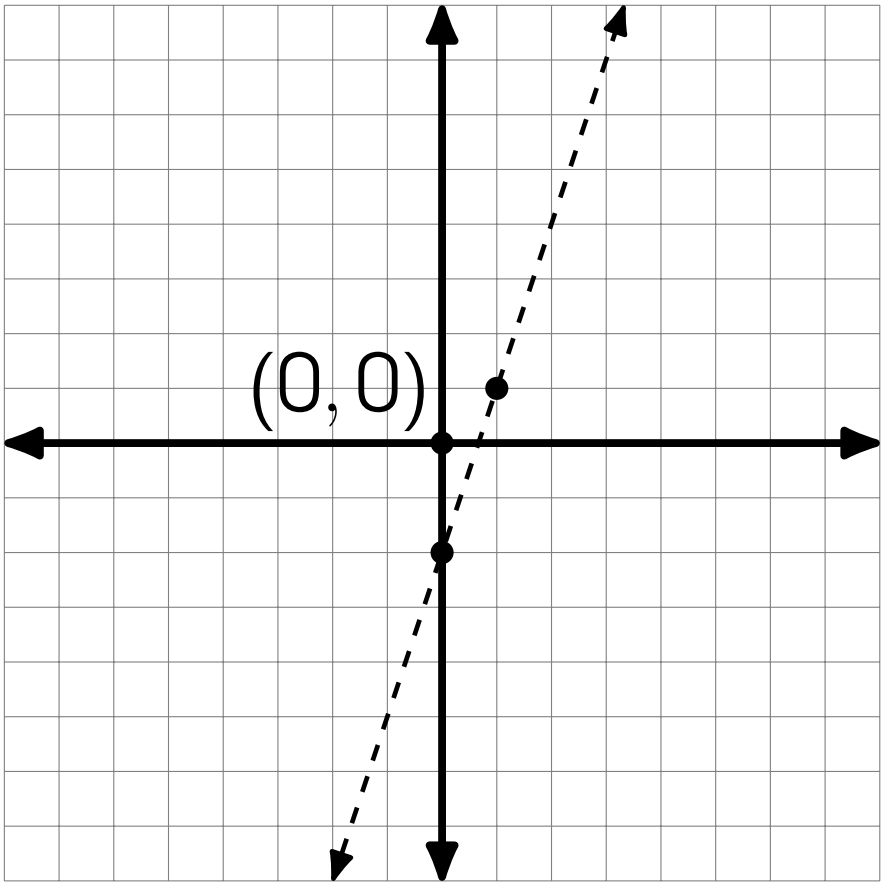

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$-3(0) + 0 < -2$

$0 + 0 < -2$

$0 < -2$

Example 4

Step 4: If the inequality is satisfied, shade the region containing that point. If not, shade the other region.

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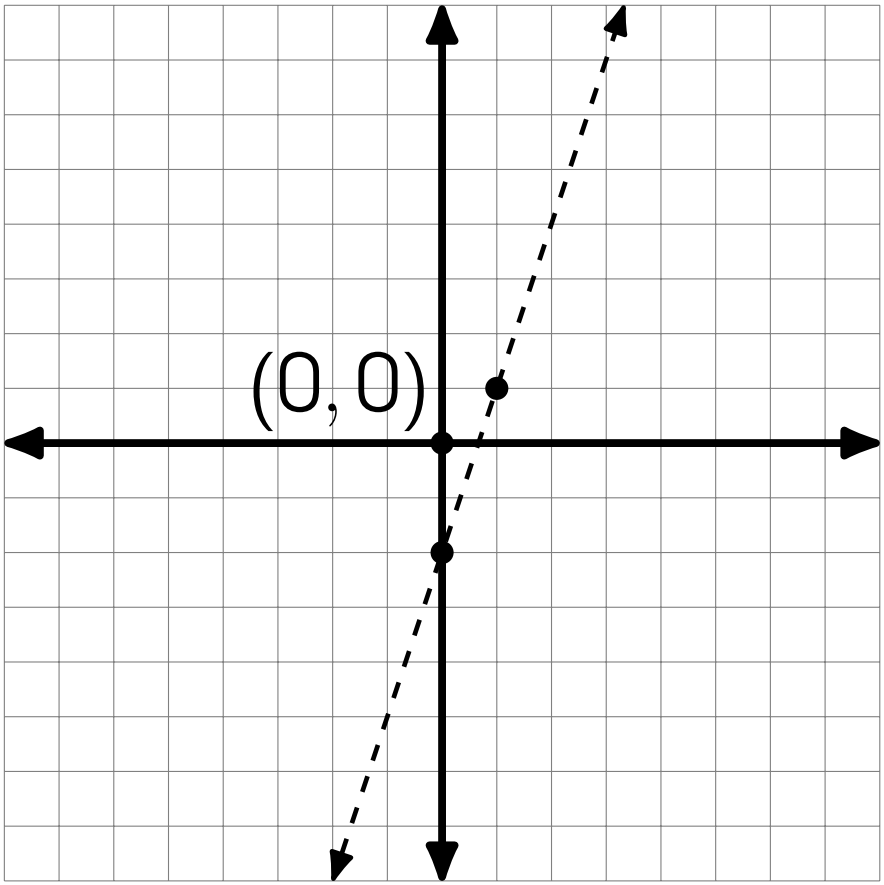

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$0 < -2$ ✘

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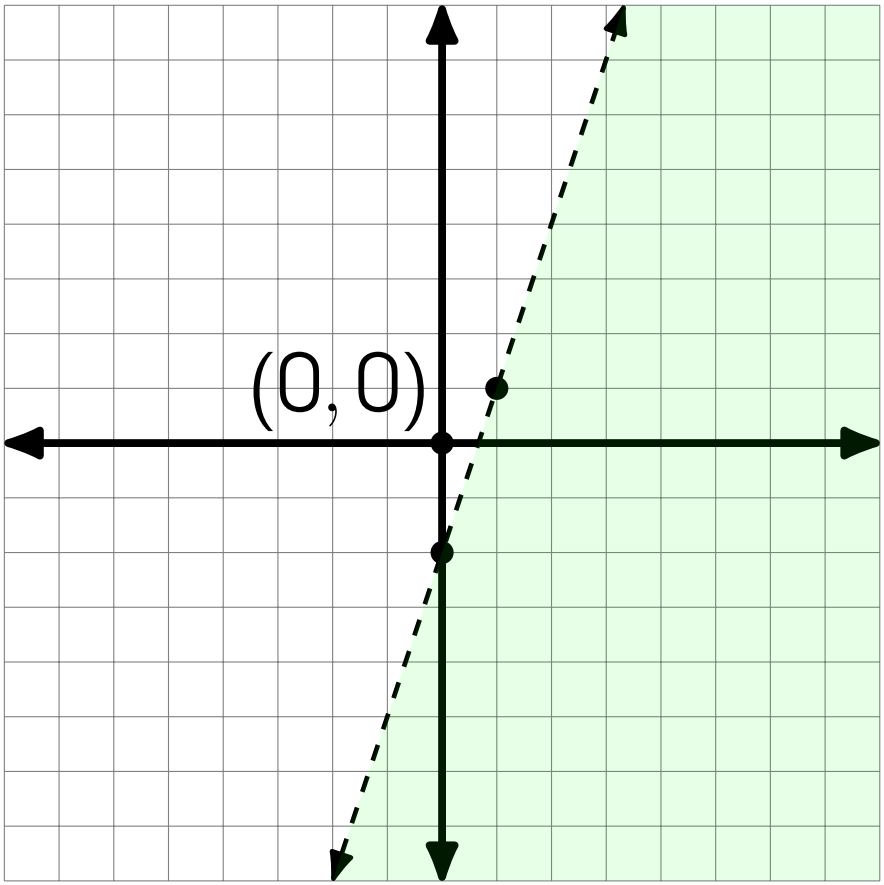

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Thank you for watching.