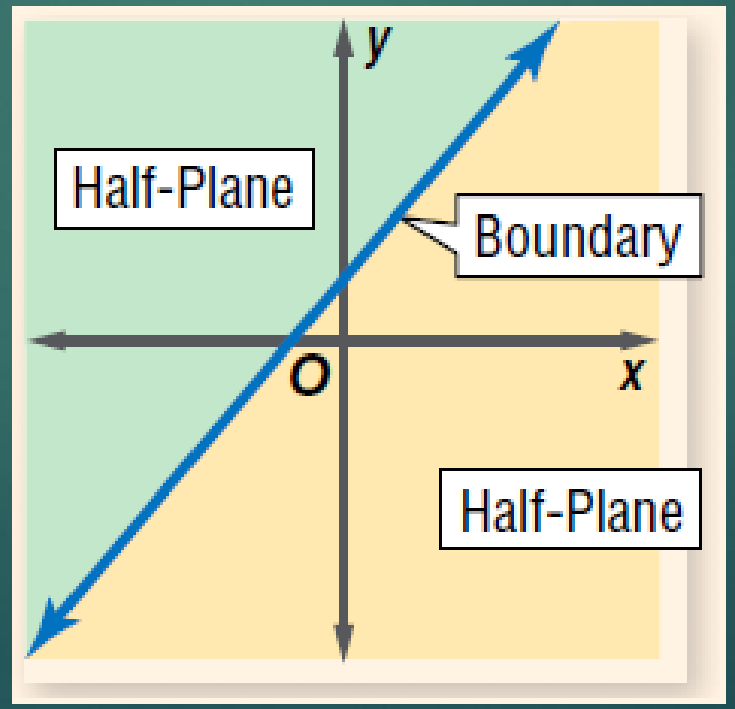
Solving Linear Inequalities

Linear Inequality

- A linear inequality is similar to a linear equation, but the equal sign is replaced with an inequality signal.
- A solution of a linear inequality is any ordered pair that makes the inequality true.

Linear Inequality

- The graph of the solutions fills a region on the coordinate plane called a half-plane.
- An equation defines the boundary for each half-plane.



Linear Inequality

- If the equation of the boundary line is not in slope-intercept form, you can choose a test point that is not on the line to determine which region to shade, or you can rewrite the equation to slope-intercept form.

Linear Inequality

Graphing Linear Inequalities	
Step 1	Solve the inequality for y (slope-intercept form).
Step 2	Graph the boundary line. Use a solid line for $\leq$ or $\geq$. Use a dashed line for $<$ or $>$.
Step 3	Shade the half-plane above the line for $y >$ or $y \geq$. Shade the half-plane below the line for $y <$ or $y \leq$. Check your answer.

Examples

- Graph $y - 2x \leq -4$

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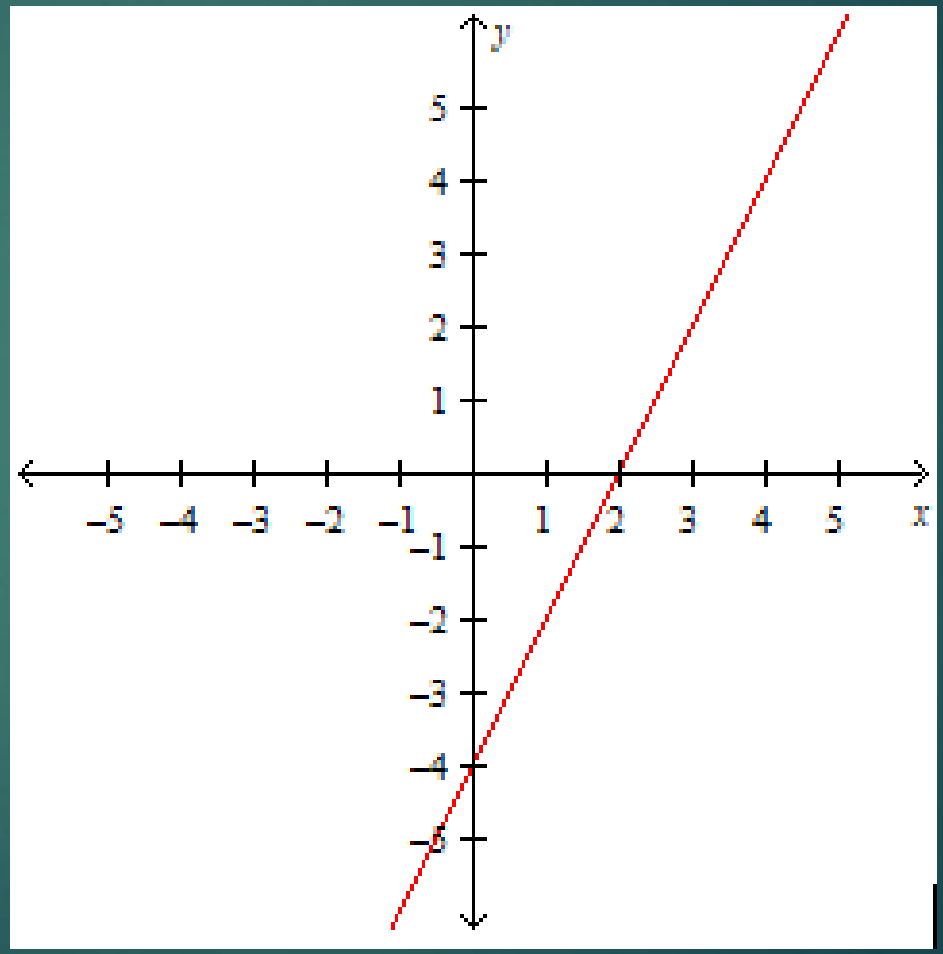
- Method 1:
- Solve the equation for y.

- $y - 2x + 2x \leq -4 + 2x$
- $y \leq 2x - 4$
- Graph $y = 2x - 4$



Examples

Select a point in one of the half-planes and use that point to test the inequality.

Test Point

- Point (,)
- $y - 2x \leq -4$
- ( ) – 2( ) ≤ -4
- ( ) ≤ -4

Check Point

- Point (,)
- $y - 2x \leq -4$
- ( ) – 2( ) ≤ -4
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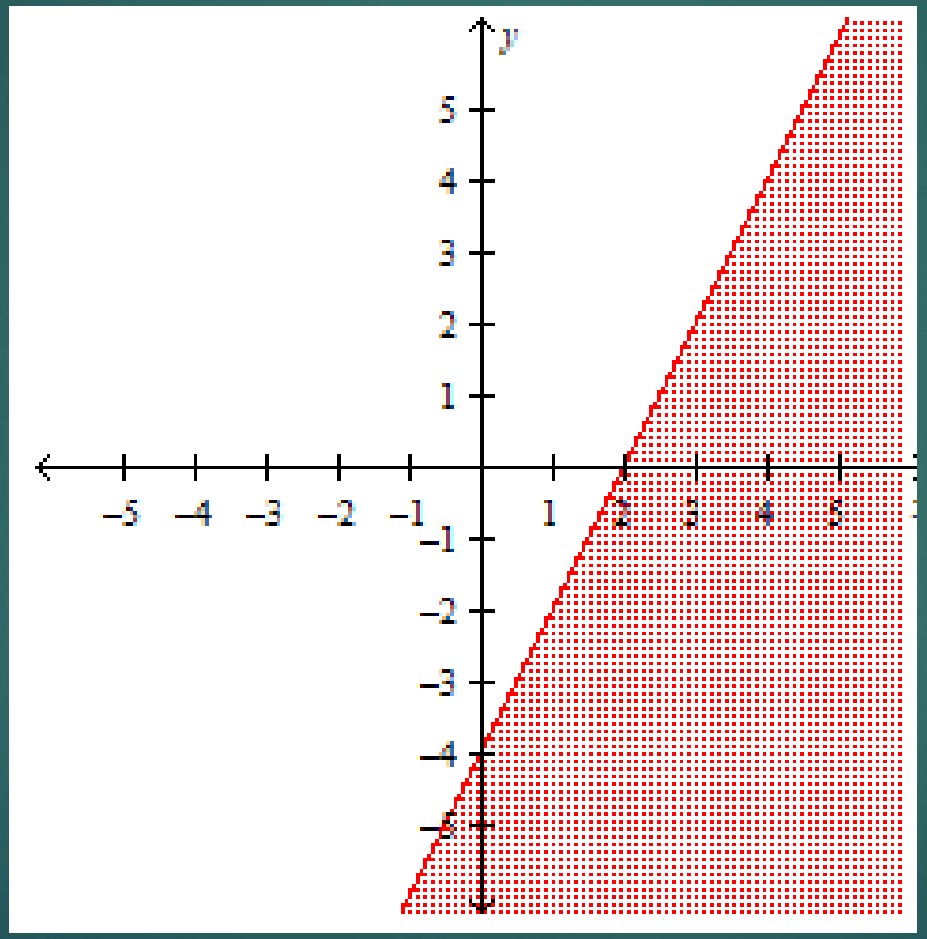
Examples



Examples

- Graph $y - 2x \leq -4$

- Method 2:
- Find the intercepts of the line
- x-intercept: make y = 0;
- $(0) - 2x \leq -4$

Examples

Graph $y - 2x \leq -4$

Method 2:
Find the intercepts of the line

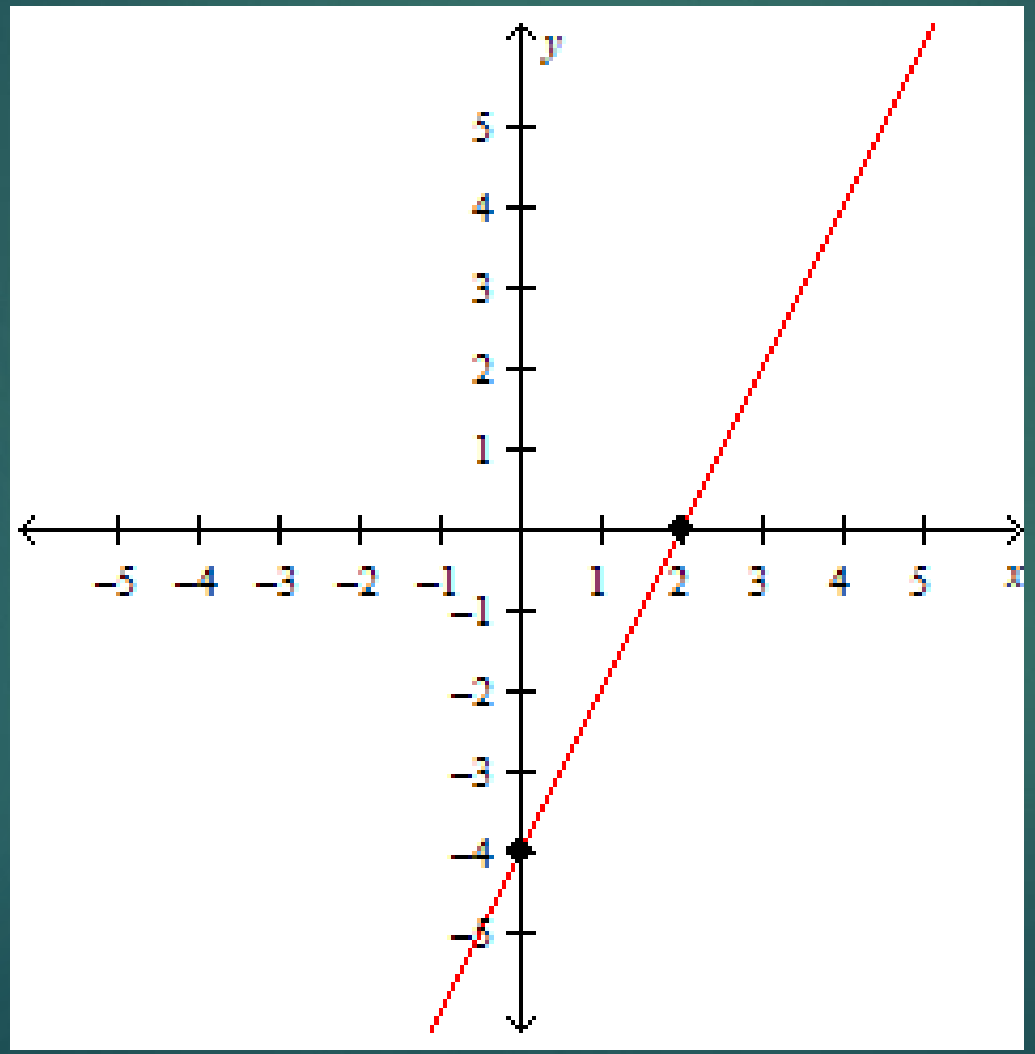
X-intercept: y = 0

- $y - 2x = -4$
- $(0) - 2x = -4$
- $\frac{-2x}{-2} = \frac{-4}{-2}$
- $x = 2$

Y-intercept: x = 0

- $y - 2x = -4$
- $y - 2(0) = -4$
- $y = -4$

Examples



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