

6-5 Reteaching

Linear Inequalities

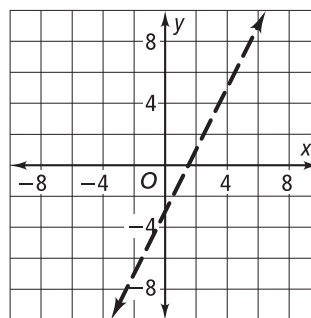
To graph an inequality, graph the line and find the solution region by substituting a test point. The point $(0, 0)$ is a good one unless the line goes through the origin.

Problem

What is the graph of $y > 2x - 3$?

Begin by graphing the line $y = 2x - 3$. Take random values for x , find the corresponding y values, and create a table.

x	$y = 2x - 3$
-2	-7
-1	-5
0	-3
1	-1
2	1



The ordered pairs are $(-2, -7)$, $(-1, -5)$, $(0, -3)$, $(1, -1)$, and $(2, 1)$. You can graph the line using these points. The line should be dashed because the inequality symbol is $>$.

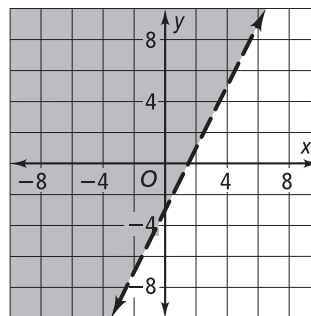
To determine which region to shade, substitute $(0, 0)$ into the inequality to see if it is a solution.

$$y > 2x - 3$$

$$0 \stackrel{?}{>} 2(0) - 3$$

$$0 > -3 \checkmark$$

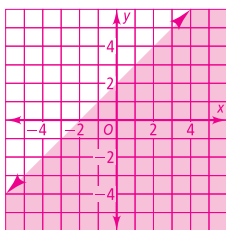
The point $(0, 0)$ satisfies the inequality and is above the line. Therefore, shade the region above the line, which is the solution region.



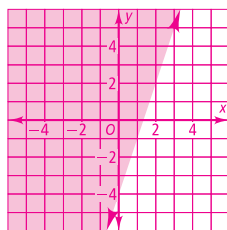
Exercises

Graph each linear inequality.

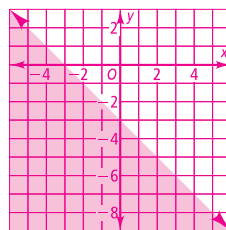
1. $y < x + 2$



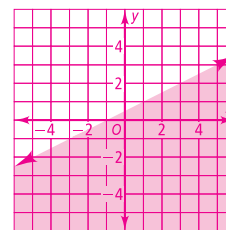
2. $y > 3x - 4$



3. $x + y < -3$



4. $x - 2y > -1$



6-5 Reteaching (continued)

Linear Inequalities

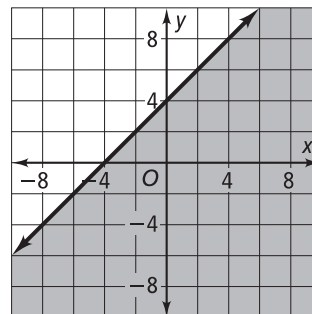
Problem

What is the inequality for the graph shown?

First look for the y -intercept for the boundary line. The y -intercept is the point $(0, 4)$.

Next determine the slope of the boundary line by finding a second point on the line, $(-4, 0)$. Use the slope formula to determine the slope: $\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 0}{0 - (-4)} = \frac{4}{4} = 1$.

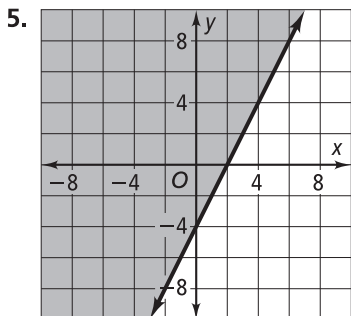
Now you know that the slope is 1 and the y -intercept is 4 and can write an equation for the boundary line $y = x + 4$.



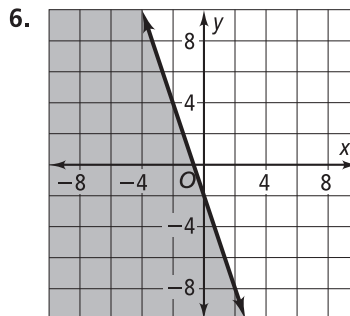
To find the inequality sign, notice that the line is solid. Then note that the shading is below the line, indicating “less than.” The inequality is $y \leq x + 4$.

Exercises

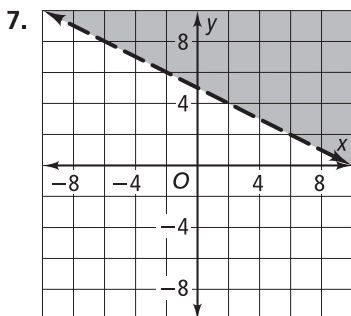
Determine the inequality for each graph shown.



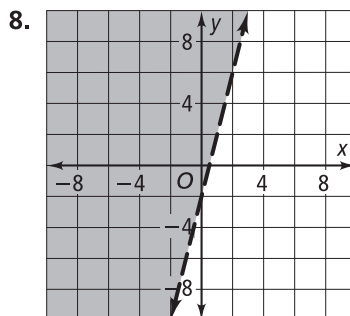
$y \geq 2x - 4$



$y \leq -3x - 2$



$y > -\frac{1}{2}x + 5$



$y > 4x - 2$