NAME _____ DATE _____ PERIOD _____

2-7 Study Guide and Intervention

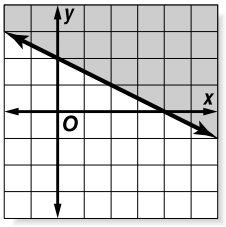
Graphing Inequalities

Graph Linear Inequalities A **linear inequality**, like $y \geq 2x - 1$, resembles a linear equation, but with an inequality sign instead of an equals sign. The graph of the related linear equation separates the coordinate plane into two half-planes. The line is the boundary of each half-plane.

To graph a linear inequality, follow these steps.

1. Graph the boundary; that is, the related linear equation. If the inequality symbol is $\leq$ or $\geq$, the boundary is solid. If the inequality symbol is $<$ or $>$, the boundary is dashed.
2. Choose a point not on the boundary and test it in the inequality. (0, 0) is a good point to choose if the boundary does not pass through the origin.
3. If a true inequality results, shade the half-plane containing your test point. If a false inequality results, shade the other half-plane.

Example **Graph $x + 2y \geq 4$.**



The boundary is the graph of $x + 2y = 4$.

Use the slope-intercept form, $y = -\frac{1}{2}x + 2$, to graph the boundary line.

The boundary line should be solid.

Now test the point (0, 0).

$0 + 2(0) \stackrel{?}{\geq} 4$ $(x, y) = (0, 0)$

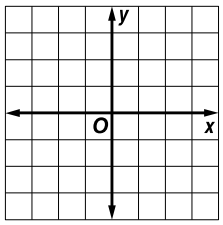
$0 \geq 4$ false

Shade the region that does *not* contain (0, 0).

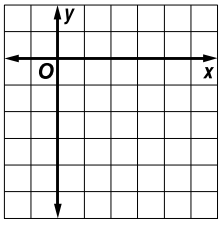
Exercises

Graph each inequality.

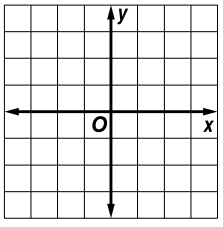
1. $y < 3x + 1$



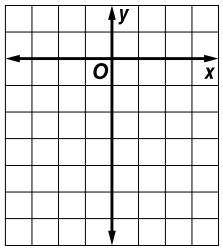
2. $y \geq x - 5$



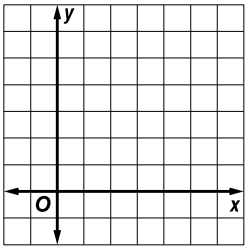
3. $4x + y \leq -1$



4. $y < \frac{x}{2} - 4$



5. $x + y > 6$



6. $0.5x - 0.25y < 1.5$