NAME _____ DATE _____ PERIOD _____

6-6 Graphing Inequalities in Two Variables

(Pages 352–357)

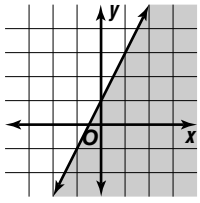
The solution set for an inequality in two variables contains ordered pairs whose graphs fill an area on the coordinate plane called a **half-plane**. An equation defines the **boundary** or edge of the half-plane.

Graphing Inequalities in Two Variables	1. Find the boundary by graphing the equation related to the inequality. If the inequality symbol is $<$ or $>$, draw the boundary as a *dashed* line. If the inequality symbol is $\leq$ or $\geq$, draw the boundary as a *solid* line to show that the points on the boundary are included in the solution set. 2. Determine which of the two half-planes contains the solutions by choosing a point in each half-plane and testing its coordinates in the inequality. If the coordinates make the inequality true, shade that half-plane.

Example

Graph $y - 2x \leq 1$.

Solve the equality for y: $y \leq 2x + 1$. Then, graph the related equation $y = 2x + 1$. Draw the line as a solid line since the inequality symbol is less than or equal to. Select a point in each of the half-planes and test it in the inequality.



Test (0, 0)

$y - 2x \leq 1$

$0 - 2(0) \leq 1$

$0 \leq 1$ *True*

Test (−1, 1)

$y - 2x \leq 1$

$1 - 2(-1) \leq 1$

$3 \leq 1$ *False*

Therefore, the half-plane that contains the point (0, 0) should be shaded.

Practice

Find which ordered pairs from the given set are part of the solution set for each inequality.

1. $y > 2x$, $\{(-3, -7), (0, 0), (1, 3), (2, 5)\}$

2. $3y + 2x \leq 8$, $\{(-1, 5), (3, -1), (5, -1), (9, 2)\}$

Graph each inequality.

3. $x > 4$

4. $x + y \leq 2$

5. $3x - 2y \leq -5$

6. $2x + 10 < 0$

7. $x - y \geq -4$

8. $y > -3$

9. Jobs It takes a librarian 1 minute to renew an old library card and 3 minutes to make a new card. Together, she can spend no more than 30 minutes renewing and making cards. Write an inequality to represent this situation, where x is the number of old cards she renews and y is the number of new cards she makes.

10. **Standardized Test Practice** Which ordered pair is a solution of $x + 2y \leq -7$?

A $(0, 0)$ **B** $(8, -8)$ **C** $(-5, 3)$ **D** $(-1, 0)$

Answers: **1.** (1, 3), (2, 5) **2.** (3, −1), (5, −1) **3–8.** See Answer Key. **9.** $x + 3y \leq 30$ **10.** B