

NAME \_\_\_\_\_ DATE \_\_\_\_\_

# Solving Compound Inequalities

(Pages 405–412)

Two inequalities considered together form a **compound inequality**.

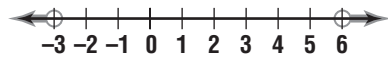
<b>AND Compound Inequalities</b>	Compound inequalities that contain the word <i>and</i> are true only if both inequalities are true. The graph of a compound inequality containing <i>and</i> is the <b>intersection</b> of the graphs of the two inequalities that make up the compound inequality. To find the intersection, determine where the two graphs overlap.
<b>OR Compound Inequalities</b>	Compound inequalities that contain the word <i>or</i> are true if one or more of the inequalities is true. The graph is the <b>union</b> of the graphs of the two inequalities that make up the compound inequality.

## EXAMPLES

Solve each compound inequality. Then graph the solution set.

**A**  $2k - 5 > 7$  or  $-3k - 1 > 8$

$$\begin{array}{l} 2k - 5 > 7 \quad \text{or} \quad -3k - 1 > 8 \\ 2k > 12 \quad \quad \quad -3k > 9 \\ k > 6 \quad \quad \quad k < -3 \end{array}$$



**B**  $4 < n + 6 < 9$

$$\begin{array}{l} n + 6 > 4 \quad \text{and} \quad n + 6 < 9 \\ n > -2 \quad \quad \quad n < 3 \end{array}$$



### Try These Together

- Graph the solution set of  $a \geq -9$  and  $a < 9$ .  
*HINT: One circle is closed and the other is open.*
- Graph the solution set of  $d < -6$  or  $d > 4$ .  
*HINT: Combine the graphs of  $d < -6$  and  $d > 4$*

## PRACTICE

- Graph the solution set of  $n < 7$  and  $n \geq 4$ .

Solve each compound inequality. Then graph the solution set.

- $6g - 8 > 4$  or  $6g + 2 < -4$
- $k + 8 > -4$  or  $k - 8 < 8$
- $1 < 2c - 7 < 7$
- $5r + 3 \geq -2$  and  $r \neq 0$

Define a variable, write a compound inequality, and solve each problem. Then check your solution.

- The sum of three times a number and two lies between 8 and 11.
- Eight less than 4 times a number is at most 24 and at least  $-12$ .



- Standardized Test Practice** If the replacement set is all integers, find the solution set for  $1 < x - 1 < 3$ .

- A** {3}                      **B** {2, 3, 4}                      **C** all integers                      **D** no solution

Answers: 1–3. See Answer Key. 4–7. For graphs, see Answer Key. 4.  $\{g \mid g > 2 \text{ or } g < -1\}$  5.  $\{k \mid k > -12 \text{ or } k < 16\}$  6.  $\{c \mid 4 < c < 7\}$  7.  $\{r \mid r \geq -1 \text{ and } r \neq 0\}$  8.  $8 < 3x + 2 < 11; \{x \mid 2 < x < 3\}$  9.  $24 \geq 4x - 8 \geq -12; \{x \mid 8 \geq x \geq -1\}$  10. A