

# Solving Compound Inequalities

(Pages 524–529)

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

<b>AND Compound Inequalities</b>	Compound inequalities that contain the word <i>and</i> are true if and 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

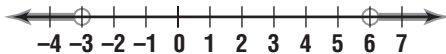
Solve each compound inequality. Graph the solution.

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

$$2k - 5 > 7 \quad \text{or} \quad -3k - 1 > 8$$

$$2k > 12 \quad -3k > 9$$

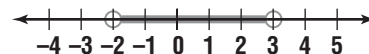
$$k > 6 \quad k < -3$$



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

$$n + 6 > 4 \quad \text{and} \quad n + 6 < 9$$

$$n > -2 \quad n < 3$$



### Try These Together

1. Graph the solution of  $a \geq -9$  and  $a < 9$ .

*HINT: One circle is closed and the other is open.*

2. Graph the solution of  $d < -6$  or  $d > 4$ .

*HINT: Combine the graphs of  $d < -6$  and  $d > 4$*

## PRACTICE

Write each compound inequality without using *and*.

3.  $k \geq 6$  and  $k < 12$

4.  $x < -2$  and  $x > -7$

5.  $a > 4$  and  $9 > a$

Graph the solution of each compound inequality.

6.  $n < 7$  and  $n \geq 4$

7.  $m > 2$  or  $m < -1$

8.  $b \geq -2$  and  $b < 6$

Solve each compound inequality. Graph the solution.

9.  $24 < 4c < 40$

10.  $4 \leq 2g < 8$

11.  $6g - 8 > 4$  or  $6g + 2 < -4$

12.  $k + 8 > -4$  or  $k - 8 < 8$

13.  $1 < 2c - 7 < 7$

14.  $-2 \leq r + 3 \leq 1$



15. **Standardized Test Practice** Solve  $8 < 3x + 2 < 11$ .

**A**  $\{x | 2 > x > 3\}$

**B**  $\{x | 2 < x < 3\}$

**C**  $\{x | 2 < x < 9\}$

**D**  $\{x | 6 < x < 9\}$

Answers: 1–2. See Answer Key for graphs. 3.  $6 \leq k < 12$  4.  $-7 < x < -2$  5.  $4 < a < 9$  6–14. See Answer Key for graphs. 15. B