## 6-4  Solving Compound Inequalities

*(Pages 339–344)*

Two inequalities considered together form a **compound inequality**.
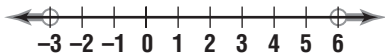
| AND Compound Inequalities | Compound inequalities that contain the word *and* are true only if both inequalities are true. The graph of a compound inequality containing *and* is the **intersection** of the graphs of the two inequalities that make up the compound inequality. To find the intersection, determine where the two graphs overlap. |
|---|---|
| OR Compound Inequalities | Compound inequalities that contain the word *or* are true if one or more of the inequalities is true. The graph is the **union** 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 $-3k - 1 > 8$

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

−3 −2 −1 0 1 2 3 4 5 6

b. $4 < n + 6 < 9$

$$n + 6 > 4 \quad \text{and} \quad n + 6 < 9$$
$$n > -2 \qquad\qquad n < 3$$

−4 −3 −2 −1 0 1 2 3 4 5

### Try These Together

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

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

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

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

**Practice**

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

**Solve each compound inequality. Then graph the solution set.**

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

**5.** $k + 8 > -4$ or $k - 8 < 8$

**6.** $1 < 2c - 7 < 7$

**7.** $5r + 3 \geq -2$ and $r \neq 0$

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

**8.** The sum of three times a number and two lies between 8 and 11.

**9.** Eight less than 4 times a number is at most 24 and at least $-12$.

**10.** **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