

Reteaching with Practice

For use with pages 346–352

GOAL

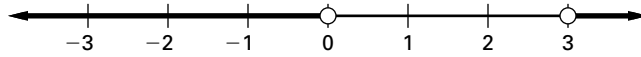
Write, solve, and graph compound inequalities and model a real-life situation with a compound inequality

VOCABULARYA **compound inequality** consists of two inequalities connected by *and* or *or*.**EXAMPLE 1****Writing Compound Inequalities**

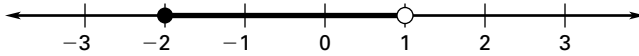
- Write an inequality that represents all real numbers that are less than 0 *or* greater than 3. Graph the inequality.
- Write an inequality that represents all real numbers that are greater than or equal to -2 *and* less than 1. Graph the inequality.

SOLUTION

a. $x < 0$ or $x > 3$



b. $-2 \leq x < 1$

**Exercises for Example 1**

Write an inequality that represents the statement and graph the inequality.

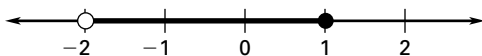
- x is greater than -4 *and* less than or equal to -2
- x is greater than 3 *or* less than -1

EXAMPLE 2**Solving a Compound Inequality with And**Solve $-9 \leq -4x - 5 < 3$. Graph the solution.**SOLUTION**Isolate the variable x between the two inequality symbols.

$$-9 \leq -4x - 5 < 3 \quad \text{Write original inequality.}$$

$$-4 \leq -4x < 8 \quad \text{Add 5 to each expression.}$$

$$1 \geq x > -2 \quad \text{Divide each expression by } -4 \text{ and} \\ \text{reverse both inequality symbols.}$$

The solution is all real numbers that are less than or equal to 1 *and* greater than -2 .

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Exercises for Example 2

Solve the inequality and graph the solution.

3. $-3 < 2x + 1 \leq 7$

4. $-6 < -3 + x < -4$

5. $2 \leq -3x + 8 < 17$

EXAMPLE 3 Solving a Compound Inequality with Or

Solve $5x + 1 < -4$ or $6x - 2 \geq 10$. Graph the solution.

SOLUTION

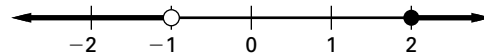
You can solve each part separately.

$$5x + 1 < -4 \quad \text{or} \quad 6x - 2 \geq 10$$

$$5x < -5 \quad \text{or} \quad 6x \geq 12$$

$$x < -1 \quad \text{or} \quad x \geq 2$$

The solution is all real numbers that are less than -1 or greater than or equal to 2 .



Exercises for Example 3

Solve the inequality and graph the solution.

6. $2x - 3 < 5$ or $3x + 1 \geq 16$

7. $-4x + 2 < 6$ or $2x \leq -6$

EXAMPLE 4 Modeling with a Compound Inequality

In 1985, a real estate property was sold for \$145,000. The property was sold again in 1999 for \$211,000. Write a compound inequality that represents the different values that the property was worth between 1985 and 1999.

SOLUTION

Use the variable v to represent the property value. Write a compound inequality with *and* to represent the different property values.

$$145,000 \leq v \leq 211,000$$

Exercise for Example 4

8. Rework Example 4 if the property was sold in 1985 for \$172,000 and was sold again in 1999 for \$226,000.