

Linear Inequalities

In this chapter, you will:

- Solve one-step and multi-step inequalities.
- Solve compound inequalities and inequalities involving absolute value.
- Graph inequalities in two variables.

Solving One-Step Inequalities (Lessons 5-1 and 5-2)

For all numbers a , b , and c , the following are true.

- If $a > b$ and c is positive, $ac > bc$.
- If $a > b$ and c is negative, $ac < bc$.

Multi-Step and Compound Inequalities (Lessons 5-3 and 5-4)

- Multi-step inequalities can be solved by undoing the operations in the same way you would solve a multi-step equation.
- A compound inequality containing *and* is only true if both inequalities are true.
- A compound inequality containing *or* is true if at least one of the inequalities is true.

Absolute Value Inequalities (Lesson 5-5)

- The absolute value of any number x is its distance from zero on a number line and is written as $|x|$. If $x \geq 0$, then $|x| = x$. If $x < 0$, then $|x| = -x$.
- If $|x| < n$ and $n > 0$, then $-n < x < n$.
- If $|x| > n$ and $n > 0$, then $x > n$ or $x < -n$.

Inequalities in Two Variables (Lesson 5-6)

To graph an inequality:

- Step 1** Graph the boundary. Use a solid line when the inequality contains \leq or \geq . Use a dashed line when the inequality contains $<$ or $>$.
- Step 2** Use a test point to determine which half-plane should be shaded.
- Step 3** Shade the half-plane.

Key Vocabulary

- boundary (p. 317)
- closed half-plane (p. 317)
- compound inequality (p. 306)
- half-plane (p. 317)
- inequality (p. 285)
- intersection (p. 306)
- open half-plane (p. 317)
- set-builder notation (p. 286)
- union (p. 307)