1.6 Solve Linear Inequalities

TEKS a.2, a.5, A.7.A, A.7.B

Before You solved linear equations.

Now You will solve linear inequalities.

Why? So you can describe temperature ranges, as in Ex. 54.

Key Vocabulary
- **linear inequality**
- **compound inequality**
- **equivalent inequalities**

A **linear inequality** in one variable can be written in one of the following forms, where a and b are real numbers and $a \neq 0$:

$$ax + b < 0 \qquad ax + b > 0 \qquad ax + b \leq 0 \qquad ax + b \geq 0$$

A **solution** of an inequality in one variable is a value that, when substituted for the variable, results in a true statement. The **graph** of an inequality in one variable consists of all points on a number line that represent solutions.

EXAMPLE 1 Graph simple inequalities

a. Graph $x < 2$.

The solutions are all real numbers less than 2.

An open dot is used in the graph to indicate 2 is *not* a solution.

b. Graph $x \geq -1$.

The solutions are all real numbers greater than or equal to −1.

A solid dot is used in the graph to indicate −1 *is* a solution.

COMPOUND INEQUALITIES A **compound inequality** consists of two simple inequalities joined by "and" or "or."

EXAMPLE 2 Graph compound inequalities

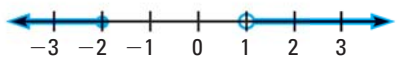
READ INEQUALITIES
The compound inequality $-1 < x < 2$ is another way of writing "$x > -1$ **and** $x < 2$."

a. Graph $-1 < x < 2$.

The solutions are all real numbers that are greater than −1 **and** less than 2.

b. Graph $x \leq -2$ or $x > 1$.

The solutions are all real numbers that are less than or equal to −2 **or** greater than 1.



✓ GUIDED PRACTICE for Examples 1 and 2

Graph the inequality.

1. $x > -5$ **2.** $x \leq 3$ **3.** $-3 \leq x < 1$ **4.** $x < 1$ or $x \geq 2$