# 5 CHAPTER SUMMARY

## BIG IDEAS

*For Your Notebook*

### Big Idea 1

### Applying Properties of Inequality

You can apply the properties of inequality to solve inequalities. The properties listed below are also true for inequalities involving ≤ and ≥.

| Property | If $a < b$, then . . . | If $a > b$, then . . . |
|---|---|---|
| Addition property of inequality | $a + c < b + c$. | $a + c > b + c$. |
| Subtraction property of inequality | $a - c < b - c$. | $a - c > b - c$. |
| Multiplication property of inequality | $ac < bc$ if $c > 0$.<br>$ac > bc$ if $c < 0$. | $ac > bc$ if $c > 0$.<br>$ac < bc$ if $c < 0$. |
| Division property of inequality | $\frac{a}{c} < \frac{b}{c}$ if $c > 0$.<br>$\frac{a}{c} > \frac{b}{c}$ if $c < 0$. | $\frac{a}{c} > \frac{b}{c}$ if $c > 0$.<br>$\frac{a}{c} < \frac{b}{c}$ if $c < 0$. |

### Big Idea 2

### Using Statements with *And* or *Or*

An absolute value equation can be rewritten as two equations joined by *or*. An absolute value inequality can be rewritten as a compound inequality with *and* or *or*. In the statements below, < can be replaced by ≤, and > can be replaced by ≥.

| Absolute value equation or inequality | Equivalent statement with *and* or *or* |
|---|---|
| $\lvert ax + b \rvert = c, c \geq 0$ | $ax + b = c$ *or* $ax + b = -c$ |
| $\lvert ax + b \rvert < c, c \geq 0$ | $-c < ax + b < c$ |
| $\lvert ax + b \rvert > c, c \geq 0$ | $ax + b < -c$ *or* $ax + b > c$ |

### Big Idea 3

### Graphing Inequalities

You use a number line to graph an inequality in one variable. Similarly, you use a coordinate plane to graph a linear inequality in two variables (including cases where one of the variables has a coefficient of 0, such as $0x + y < 1$, or $y < 1$).

| Graphing inequalities in one variable | Graphing linear inequalities in two variables |
|---|---|
| Graph simple inequalities:<br>1. Solve for the variable.<br>2. Draw an open circle for < or > and a closed circle for ≤ or ≥. Draw an arrow in the appropriate direction.<br><br>Graph compound inequalities:<br>1. Solve the compound inequality.<br>2. Use the union of graphs of simple inequalities for *or*. Use the intersection for *and*. | 1. Graph the boundary line. Use a solid line for ≤ or ≥ and a dashed line for < or >.<br>2. Test a point that does not lie on the boundary line.<br>3. Shade the half-plane containing the point if the ordered pair is a solution of the inequality. Shade the other half-plane if the ordered pair is *not* a solution. |