



# 1-7 Mathematical Literacy and Vocabulary

## Absolute Value Equations and Inequalities

### Problem

What are the solutions of  $|x| + 4 = 7$ ? Justify your step and check your solutions.

$$|x| + 4 = 7$$

Write the original equation.

$$|x| + 4 - 4 = 7 - 4$$

Subtract 4 from each side.

$$|x| = 3$$

Simplify.

$$x = 3 \text{ or } x = -3$$

Definition of absolute value

**Check**  $|x| + 4 = 7$

$$|3| + 4 = 7$$

Substitute 3 and  $-3$  for  $x$ .

$$3 + 4 = 7 \checkmark$$

$$|x| + 4 = 7$$

$$|-3| + 4 = 7$$

$$3 + 4 = 7 \checkmark$$

### Exercise

The solution for  $2|r| - 3 = 5$  is shown? Justify your steps and check your solutions.

$$2|r| - 3 = 5$$

$$2|r| - 3 + 3 = 5 + 3$$

$$2|r| = 8$$

$$\frac{2|r|}{2} = \frac{8}{2}$$

$$|r| = 4$$

$$r = 4 \text{ or } r = -4$$

**Check**  $2|r| - 3 = -5$

$$2 \square - 3 = 5$$

$$\square - 3 = 5 \checkmark$$

Substitute  $\square$  and  $\square$  for  $r$ .

$$2|r| - 3 = -5$$

$$2 \square - 3 = 5$$

$$\square - 3 = 5 \checkmark$$