

# 6.2 Solve Inequalities Using Multiplication and Division

TEKS A.7.A, A.7.B

**Before**

You solved inequalities using addition and subtraction.

**Now**

You will solve inequalities using multiplication and division.

**Why?**

So you can find possible distances traveled, as in Ex. 40.



## Key Vocabulary

- **inequality**, p. 21
- **equivalent inequalities**, p. 357

Solving an inequality using multiplication is similar to solving an equation using multiplication, but it is different in an important way.

## KEY CONCEPT

*For Your Notebook*

### Multiplication Property of Inequality

**Words** Multiplying each side of an inequality by a *positive* number produces an equivalent inequality.

Multiplying each side of an inequality by a *negative* number and *reversing the direction of the inequality symbol* produces an equivalent inequality.

**Algebra** If  $a < b$  and  $c > 0$ , then  $ac < bc$ .      If  $a < b$  and  $c < 0$ , then  $ac > bc$ .  
 If  $a > b$  and  $c > 0$ , then  $ac > bc$ .      If  $a > b$  and  $c < 0$ , then  $ac < bc$ .

This property is also true for inequalities involving  $\leq$  and  $\geq$ .

## EXAMPLE 1 Solve an inequality using multiplication

Solve  $\frac{x}{4} < 5$ . Graph your solution.

$$\frac{x}{4} < 5 \quad \text{Write original inequality.}$$

$$4 \cdot \frac{x}{4} < 4 \cdot 5 \quad \text{Multiply each side by 4.}$$

$$x < 20 \quad \text{Simplify.}$$

▶ The solutions are all real numbers less than 20. Check by substituting a number less than 20 in the original inequality.



## GUIDED PRACTICE for Example 1

Solve the inequality. Graph your solution.

1.  $\frac{x}{3} > 8$

2.  $\frac{m}{8} \leq -2$

3.  $\frac{y}{2.5} \geq -4$