

## Chapter 7

## Equations and Inequalities

Date:

### 7.3 Solving Equations Using Multiplication or Division

**Essential Question**

How can you use multiplication or division to solve an equation?

**Key Idea**



### Key Ideas

#### Multiplication Property of Equality

**Words** When you multiply each side of an equation by the same nonzero number, the two sides remain equal.

**Numbers**  $\frac{8}{4} = 2$

$$\frac{8}{4} \cdot 4 = 2 \cdot 4$$

$$8 = 8$$

**Algebra**  $\frac{x}{4} = 2$

$$\frac{x}{4} \cdot 4 = 2 \cdot 4$$

$$x = 8$$

#### Multiplicative Inverse Property

**Words** The product of a nonzero number  $n$  and its reciprocal,  $\frac{1}{n}$ , is 1.

**Numbers**  $5 \cdot \frac{1}{5} = 1$

**Algebra**  $n \cdot \frac{1}{n} = \frac{1}{n} \cdot n = 1, n \neq 0$

## Composition Book

### 7.3 Solving Equations Using Multiplication or Division

1) Solve.

$$\frac{W}{4} = 12$$

$$4 \cdot \frac{W}{4} = 12 \cdot 4$$

$$W = 48$$

2)

$$\frac{2}{7}x = 6$$

$$\frac{7}{2} \cdot \frac{2}{7}x = 6 \cdot \frac{7}{2}$$

$$\cancel{\frac{7}{2}} \cdot \cancel{\frac{2}{7}}x = \overset{3}{\cancel{6}} \cdot \frac{7}{\cancel{2}_1}$$

$$x = 21$$

Look at your notes page.



To cancel a fraction multiply by its reciprocal.

Example:  $\frac{2}{3} \cdot \frac{3}{2}$

fraction                  reciprocal

The diagram shows the multiplication of the fraction 2/3 by its reciprocal 3/2. A gray arrow points from the word 'fraction' to the fraction 2/3, and another gray arrow points from the word 'reciprocal' to the fraction 3/2. The two fractions are separated by a multiplication dot.

Complete numbers 1 - 4 on your notes page.

Solve.

$$1) \quad 5 \cdot 6 = \frac{t}{5} \cdot 5$$

$$30 = t$$

$$3) \quad \frac{\cancel{4}}{\cancel{3}} \cdot \frac{\cancel{3}}{\cancel{4}} y = \overset{3}{\cancel{9}} \cdot \frac{4}{\cancel{3}_1}$$

$$y = 12$$

$$2) \quad 2 \cdot \frac{x}{2} = 9 \cdot 2$$

$$x = 18$$

$$4) \quad \frac{\cancel{3}}{\cancel{2}} \cdot \frac{\cancel{2}}{\cancel{3}} m = \overset{5}{\cancel{10}} \cdot \frac{3}{\cancel{2}_1}$$

$$m = 15$$

Look at your notes page.



## Key Idea

### Division Property of Equality

**Words** When you divide each side of an equation by the same nonzero number, the two sides remain equal.

**Numbers**

$$8 \cdot 4 = 32$$

$$8 \cdot 4 \div 4 = 32 \div 4$$

$$8 = 8$$

**Algebra**  $4x = 32$

$$\frac{4x}{4} = \frac{32}{4}$$

$$x = 8$$