

**Study Guide and Intervention**

7NS1.3, 7NS1.7

**Algebra: The Percent Equation**

A **percent equation** is an equivalent form of a percent proportion in which the percent is written as a decimal.

$$\text{part} = \text{percent} \cdot \text{whole}$$

**Example 1** Find 22% of 245.

The percent is 22%, and the whole is 245. Let  $n$  represent the part.

$$n = 0.22(245) \quad \text{Write 22\% as the decimal 0.22.}$$

$$n = 53.9 \quad \text{Simplify.}$$

So, 22% of 245 is 53.9.

**Example 2** 600 is what percent of 750?

The part is 600, and the whole is 750. Let  $n$  represent the percent.

$$600 = n(750) \quad \text{Write the equation.}$$

$$\frac{600}{750} = \frac{750n}{750} \quad \text{Divide each side by 750.}$$

$$0.8 = n \quad \text{Simplify.}$$

Since  $0.8 = 80\%$ , 600 is 80% of 750.

**Example 3** 45 is 90% of what number?

The part is 45, and the percent is 90%. Let  $n$  represent the whole.

$$45 = 0.90 \cdot n \quad \text{Write 90\% as the decimal 0.90.}$$

$$\frac{45}{0.90} = \frac{0.90n}{0.90} \quad \text{Divide each side by 0.90.}$$

$$50 = n \quad \text{Simplify.}$$

So, 45 is 90% of 50.

**Exercises**

Solve each problem using the percent equation.

- Find 30% of 70. **21**
- What is 80% of 65? **52**
- What percent of 56 is 14? **25%**
- 36 is what percent of 40? **90%**
- 80 is 40% of what number? **200**
- 65% of what number is 78? **120**
- What percent of 2,000 is 8? **0.4%**
- 12 is what percent of 4,000? **0.3%**
- What percent of 3,000 is 18? **0.6%**
- What is 110% of 80? **88**
- Find 180% of 160. **288**
- 4% of what number is 11? **275**

**Study Guide and Intervention**

7NS1.6, 7NS1.7

**Percent of Change**

To find the percent of change, first find the amount of change. Then find the ratio of that amount to the original amount, and write the ratio as a percent.

**Example**

Two months ago, the bicycle shop sold 50 bicycles. Last month, 55 bicycles were sold. Find the percent of change. State whether the percent of change is an *increase* or a *decrease*.

**Step 1** Subtract to find the amount of change.

$$55 - 50 = 5$$

**Step 2** Write a ratio that compares the amount of change to the original number of bicycles.

**Step 3** Write the ratio as a percent.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$$

Definition of percent of change

$$= \frac{5}{50}$$

The amount of change is 5. The original amount is 50.

$$= 0.1 \text{ or } 10\%$$

Divide. Write as a percent.

The percent of change is 10%. Since the new amount is greater than the original, it is a percent of increase.

**Exercises**

Find each percent of change. Round to the nearest tenth of a percent if necessary. State whether the percent of change is an *increase* or a *decrease*.

1. original: 4

new: 5

**25%; increase**

2. original: 10

new: 13

**30%; increase**

3. original: 15

new: 12

**20%; decrease**

4. original: 30

new: 18

**40%; decrease**

5. original: 60

new: 63

**5%; increase**

6. original: 160

new: 136

**15%; decrease**

7. original: 77

new: 105

**36.4%; increase**

8. original: 96

new: 59

**38.5%; decrease**

**Study Guide and Intervention**

7NS1.7

**Simple Interest**

To find simple interest, use the formula  $I = prt$ . Interest  $I$  is the amount of money paid or earned. Principal  $p$  is the amount of money invested or borrowed. Rate  $r$  is the annual interest rate. Time  $t$  is the time in years.

**Example 1** Find the simple interest for \$600 invested at 8.5% for 6 months.

Notice the time is given in months. Six months is  $\frac{6}{12}$  or  $\frac{1}{2}$  year.

$I = prt$  Write the simple interest formula.

$I = 600 \cdot 0.085 \cdot \frac{1}{2}$  Replace  $p$  with 600,  $r$  with 0.085, and  $t$  with  $\frac{1}{2}$ .

$I = 25.50$  Simplify.

The simple interest is \$25.50.

**Example 2** Find the total amount in an account where \$136 is invested at 7.5% for 2 years.

$I = prt$  Write the simple interest formula.

$I = 136 \cdot 0.075 \cdot 2$  Replace  $p$  with 136,  $r$  with 0.075, and  $t$  with 2.

$I = 20.40$  Simplify.

The simple interest is \$20.40. The amount in the account is  $\$136 + \$20.40 = \$156.40$ .

**Exercises**

**Find the simple interest to the nearest cent.**

- |  |   |
|--|---|
| 1. \$300 at 5% for 2 years<br><b>\$30.00</b>       | 2. \$650 at 8% for 3 years<br><b>\$156.00</b>                 |
| 3. \$575 at 4.5% for 4 years<br><b>\$103.50</b>    | 4. \$735 at 7% for $2\frac{1}{2}$ years<br><b>\$128.63</b>    |
| 5. \$1,665 at 6.75% for 3 years<br><b>\$337.16</b> | 6. \$2,105 at 11% for $1\frac{3}{4}$ years<br><b>\$405.21</b> |

**Find the total amount in each account to the nearest cent.**

- |   |   |
|---|---|
| 7. \$250 at 5% for 3 years<br><b>\$287.50</b>                     | 8. \$425 at 6% for 2 years<br><b>\$476.00</b>                     |
| 9. \$945 at 7.25% for 4 years<br><b>\$1,219.05</b>                | 10. \$1,250 at 7.4% for $2\frac{1}{4}$ years<br><b>\$1,458.13</b> |
| 11. \$2,680 at 9.1% for $1\frac{3}{4}$ years<br><b>\$3,106.79</b> | 12. \$4,205 at 4.5% for $3\frac{1}{2}$ years<br><b>\$4,867.29</b> |