

Calculating with Percents

To represent “ a is p percent of w ,” use the **percent proportion** or the **percent equation**.

Percent Proportion	Percent Equation
$\frac{a}{w} = \frac{p}{100}$	$a = p \cdot w$

Example 1 Answer each question.

a. What percent of 40 is 18?

percent proportion: $\frac{18}{40} = \frac{p}{100}$

$$1800 = 40p$$

$$45 = p$$

percent equation: $18 = p \cdot 40$

$$0.45 = p$$

▶ So, 45% of 40 is 18.

b. What number is 32% of 75?

$$\frac{a}{75} = \frac{32}{100}$$

$$100a = 2400$$

$$a = 24$$

$$a = 0.32 \cdot 75$$

$$a = 24$$

▶ So, 24 is 32% of 75.

c. 125% of what number is 80?

$$\frac{80}{w} = \frac{125}{100}$$

$$8000 = 125w$$

$$64 = w$$

$$80 = 1.25 \cdot w$$

$$64 = w$$

▶ So, 125% of 64 is 80.

A **percent of change** is the percent that a quantity changes from the original amount.

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

Example 2 Find the percent of change.

a. Your number of hours worked increases from 24 hours to 42 hours.

$$\frac{42 - 24}{24} = \frac{18}{24} = 0.75$$

▶ The change is a 75% increase.

b. A price decreases from \$25.75 to \$15.50.

$$\frac{25.75 - 15.50}{25.75} = \frac{10.25}{25.75} \approx 0.40$$

▶ The change is about a 40% decrease.

Practice

Check your answers at BigIdeasMath.com.

Use the percent proportion to answer the question.

1. 80% of what number is 64?
80

2. What number is 15% of 130?
19.5

3. What percent of 240 is 6?
2.5%

Use the percent equation to answer the question.

4. What number is 55% of 94?
51.7

5. 3% of what number is 111?
3700

6. What percent of 72 is 64?
88.8%

Find the percent of change. Round to the nearest percent, if necessary.

7. A club’s membership increases from 540 members to 995 members.
84% increase

8. A graduating class decreases from 482 students to 398 students.
17% decrease