A percent increase is the amount that a quantity has increased based on a percent of the original amount. A percent decrease is the amount that a quantity has decreased based on a percent of the original amount. An equation that represents either situation is:

\[ \text{amount of increase or decrease} = (\% \text{ change})(\text{original amount}) \]

For additional information see the Math Notes box in Lesson 7.1.1 of the Core Connections, Course 2 text.

**Example 1**

A town’s population grew from 1879 to 7426 over five years. What was the percent increase in the population?

- Subtract to find the change:
  \[ 7426 - 1879 = 5547 \]
- Put the known numbers in the equation:
  \[ 5547 = (x)(1879) \]
- The scale factor becomes \( x \), the unknown:
  \[ \frac{5547}{1879} = x \]
- Divide: \( x = \frac{5547}{1879} \approx 2.952 \)
- Change to percent: \( x = 295.2\% \)

The population increased by 295.2%.

**Example 2**

A sumo wrestler retired from sumo wrestling and went on a diet. When he retired he weighed 385 pounds. After two years he weighed 238 pounds. What was the percent decrease in his weight?

- Subtract to find the change:
  \[ 385 - 238 = 147 \]
- Put the known numbers in the equation:
  \[ 147 = (x)(385) \]
- The scale factor becomes \( x \), the unknown:
  \[ \frac{147}{385} = x \]
- Divide: \( x = \frac{147}{385} \approx 0.382 \)
- Change to percent: \( x \approx 38.2\% \)

His weight decreased by about 38.2%.
Problems

Solve the following problems.

1. Forty years ago gasoline cost $0.30 per gallon on average. Ten years ago gasoline averaged about $1.50 per gallon. What is the percent increase in the cost of gasoline?

2. When Spencer was 5, he was 28 inches tall. Today he is 5 feet 3 inches tall. What is the percent increase in Spencer’s height?

3. The cars of the early 1900s cost $500. Today a new car costs an average of $27,000. What is the percent increase of the cost of an automobile?

4. The population of the U.S. at the first census in 1790 was 3,929 people. By 2000 the population had increased to 284,000,000! What is the percent increase in the population?

5. In 2000 the rate for a first class U.S. postage stamp increased to $0.34. This represents a $0.31 increase since 1917. What is the percent increase in cost since 1917?

6. In 1906 Americans consumed an average of 26.85 gallons of whole milk per year. By 1998 the average consumption was 8.32 gallons. What is the percent decrease in consumption of whole milk?

7. In 1984 there were 125 students for each computer in U.S. public schools. By 1998 there were 6.1 students for each computer. What is the percent decrease in the ratio of students to computers?

8. Sara bought a dress on sale for $30. She saved 45%. What was the original cost?

9. Pat was shopping and found a jacket with the original price of $120 on sale for $9.99. What was the percent decrease in the cost?

10. The price of a pair of pants decreased from $49.99 to $19.95. What was the percent decrease in the price?

Answers

1. 400% 2. 125% 3. 5300% 4. 7,228,202.4%
5. ≈ 1033.33% 6. 69.01% 7. 95.12% 8. $55
9. 91.7% 10. 60.1%