

Objectives

- Build the skill of problem solving.
- Percent increase and percent decrease.

Exercises

1. 10 fewer than four times a number is 78. Find the number.
2. Ted drove on a town road at 35 mph and then on an interstate highway at 65 mph. He drove twice the amount of time on the interstate as he did on the town road. If he drove a total of 165 miles, how far did he drive on the interstate?
3. The length of a rectangle is 4 cm. longer than its width. If the perimeter is 28 cm. find the length and width.

	examples	algebraic representation
consecutive integers	23, 24, 25, 26, 27 -17, -16, -15, -14, -13	$x, x + 1, x + 2$ , and so on
consecutive even integers	4, 6, 8, 10, 12 -26, -24, -22, -20, -18	$x, x + 2, x + 4$ , and so on
consecutive odd integers	5, 7, 9, 11, 13 -43, -41, -39, -37, -35	$x, x + 2, x + 4$ , and so on

4. The hotel rooms at Gates Hotel are numbered consecutively. The sum of two consecutive hotel room numbers is 2245. Find the hotel room numbers.
5. When the lesser of two consecutively odd integers is subtracted from twice the greater, the result is 189. Find the two numbers.
6. The second angle of a triangular kite is four times as large as the first. The third angle is  $5^\circ$  more than the sum of the other two angles. Find the degree measure of the second angle.
7. A rental car company charges \$50 per day and \$0.35 a mile for car rental. A customer rented a car for 5 days and paid \$332.95 for the rental. What was the mileage she was charged for?

You will encounter lots of percent increase and percent decrease problems throughout your lifetime. For example, you may need to answer questions related to percentage increase or decrease in assets over time, and questions related to sales tax, salary increases, reductions in quantities, lowered purchase prices and body weight loss.

For each example of percentage increase or decrease, there are three amounts:

1. the original amount,
2. the amount of increase or decrease, and
3. the new amount.

**Guidelines**

$$\left( \begin{array}{l} \text{amount of} \\ \text{decrease} \end{array} \right) = \left( \begin{array}{l} \text{original} \\ \text{amount} \end{array} \right) - \left( \begin{array}{l} \text{new} \\ \text{amount} \end{array} \right)$$

$$\left( \begin{array}{l} \text{amount of} \\ \text{increase} \end{array} \right) = \left( \begin{array}{l} \text{new} \\ \text{amount} \end{array} \right) - \left( \begin{array}{l} \text{original} \\ \text{amount} \end{array} \right)$$

- The percent increase or percent decrease is calculated on the basis of the original amount.

**Percent Decrease Equation**

The amount of decrease is  $p$  percent of the original amount.

$$\left( \begin{array}{c} \text{amount of} \\ \text{decrease} \end{array} \right) = p \cdot \left( \begin{array}{c} \text{original} \\ \text{amount} \end{array} \right)$$

**Percent Increase Equation**

The amount of increase is  $p$  percent of the original amount.

$$\left( \begin{array}{c} \text{amount of} \\ \text{increase} \end{array} \right) = p \cdot \left( \begin{array}{c} \text{original} \\ \text{amount} \end{array} \right)$$

8. After many years of hard work, Rocio gained employment with a new company. She makes \$80,000 per year with the new organization. Her old job paid \$62,000 per year. What is the percentage increase in Rocio's salary? Round your answer to the nearest whole number percent.
9. Gerardo lost 34% of his retirement account during the financial crisis of 2007–2008. The value of his account dropped to \$264,000. How much was his retirement account worth before the decrease?
10. Find the original price of a pair of boots if the sale price is \$120 after a 20% discount.

*Answers:* 1) 22, 2) 130 mi, 3) 9 cm, 5 cm, 4) 1122, 1123, 5) 187, 189, 6) 70°, 7) Let  $x$  be the mileage.  
 $\$332.95 = (\$50)(5) + (0.35)x$ ,  $x = 237$  mi. 8)  $\$18000 = p \cdot \$62000$  29%, 9)  $x - 264,000 = 0.34x$ ,  
 $x = \$400,000$ , 10) \$150