

Section 2.5 One-Step Equations with Percentages

Review of Percentages

Compare these two quiz scores: $\frac{42}{50}$ and $\frac{17}{20}$. Which is the higher score?

1. Complete the missing values in the tables.

Decimal	Percent
0.50	
0.93	
0.06	
1.2	

Decimal	Percent
	80%
	150%
	16.5%
	2%

Using Equations to Solve Percent Problems

$$A = P \cdot B$$

2. Write an equation and solve it algebraically. Check it mentally and write the answer in a complete sentence.

a. What is 37% of 42?

b. What percent of 60 is 52?

c. 24% of what number is 50.4?

3. Write an equation and solve it algebraically. Check it mentally and write the answer in a complete sentence.

a. 74% of what number is 120?

b. What percent of 30 is 8?

c. What is 18% of 90?

Percent Applications

4. Maria plays basketball and last season she attempted 48 free throws and made 38 of them. What percentage of her free throws did she make?

5. Jess earned \$550 in commissions last month, which is 5% of the jewelry they sell. How much did Jess sell?

Percent Increase/Decrease

$$A = P \cdot B$$

6. The cafeteria used to sell chocolate chip cookies for \$0.75 each. They recently raised the price to \$1.00.
- What is the amount of the increase?
 - What is the percentage increase?
7. In a city there were 5,000 people unemployed which went down to 4,325 the following year.
- What was the decrease in the number of unemployed people?
 - What was the percentage decrease in unemployment?

Section 2.6 Modeling with Equations and Inequalities

**Finding an Original Price given a Percentage and the Total

8. The price of a restaurant bill, including an 18% gratuity charge was \$110.43. What was the price of the bill before the gratuity was added?

9. The company Metromile sells car insurance based on how many miles you drive rather than a fixed rate. As an example, on www.Metromile.com, it could cost \$30 per month and 3.2 cents per mile (rates may vary).

- a. To compare with yearly insurance rates, let's make a table with the number of miles driven per year. Define a variable:

- b. Fill in a few rows of the table to understand the pattern, and write an expression in terms of the variable in the last row.

	Cost of Insurance for 1 year

c. If you are currently paying \$800 per year with a fixed-price insurance company, how many miles would you have to drive to get a better deal with Metromile? Write an inequality. (We will not solve it yet.)

Translating Phrases

Written form

Algebraic form

- Addition: The _____ of _____ and _____.
- Subtraction: The _____ of _____ and _____.
- Multiplication: The _____ of _____ and _____.
- Division: The _____ of _____ and _____.

10. Translate the Following Expressions/Equations/Inequalities

- a. Two less than a number
- b. The product of 4 and a number is greater than 6.
- c. 45% of a number
- d. The quotient of a number and nine is 8.5.

More Practice

11. A book was on sale for 15% off and the sale price was \$16.99. What was the original price of the book? Write an equation to model this scenario. Do not solve it yet.

12. At the Mad Genius Escape Room on Hawthorne, the cost is \$30 per person. If you want the room to be private for your party the cost is \$27 plus \$24 per person. Define a variable and write an expression for each scenario. Source: <https://www.madgeniusesescapes.com/faq>

	Total Cost (not private)	Total Cost (private)

Write an equation that represents how many people it would take for the two plans to be equal. (We will not solve it yet.)

13. A rental car company charges a base weekend fee of \$35.95 and then \$0.58 cents per mile. If the total bill is \$120, how many miles were driven? Write an equation to model this scenario. Do not solve it yet.

14. Translate the Following Expressions/Equations/Inequalities

- a. The quotient of a number and 7 is 3.
- b. Half of a number.
- c. A number increased by 12
- d. Five less than two times a number is greater than or equal to 87.

15. Write an equation and solve it algebraically. Check it mentally and write the answer in a complete sentence.

a. What percent of 40 is 160?

b. What is 75% of 32?

c. 82 is 15% of what?

16. Ronin has an annual salary of \$36,000 and he is getting a 2.5% raise. How much is his raise and his new salary?

17. A book was on sale for \$15.99 and the original price was \$26.99. What percent off was the book?

18. The population of dogs in a shelter decreased from 52 to 39. What is the percentage decrease?