Learning Objectives:
1. Understanding percent.
2. Write percents as decimals or fractions.
3. Write decimals or fractions as percents.
4. Applications with percents, decimals, and fractions.
5. Key Vocabulary: percent.

1. Understanding percent

**Percent** means “per 100” and “per” means “division” (75% means 75 out of 100)

\[ \text{“} \% \text{” means } \frac{1}{100} \text{ so “} \text{n} \% \text{” means } \frac{n}{100} \text{ or “} n \cdot \frac{1}{100} \text{”} \]

**Example 1.** Write the percent described by each sentence.

1. Sixty-two parts were defective out of 100. What percent were defective?

   Answer: __________________________

2. In a recent survey of 100 students, 37 of the students indicated that they eat lunch at the dining hall. What percent of the students surveyed do not eat lunch in the dining hall?

   Answer: __________________________

2. Write percents as decimals or fractions

1. **Percent to Decimal**—replace the percent symbol with \( \frac{1}{100} \) and then multiply by moving the decimal point to the left two places digit.

2. **Percent to Fraction**—replace % symbol with \( \frac{1}{100} \) and then write the fraction in simplest form.

**Example 2.** Write each percent as a decimal.

1. 0.02%

   Answer: __________________________

2. 10 \( \frac{1}{4} \) %

   Answer: __________________________
3. **Write decimals or fractions as percents**
   1. **Decimal to Percent**—is to multiply the given decimal by 100% that is by moving decimal point to the right two places digit.
   2. **Fraction to Percent**—is to multiply the given decimal by 100%
   3. **Mixed Number to Percent**—converts mixed number to improper number and then multiply by 100%

**Example 3.** Write each decimal or fraction or mixed number as a percent.

1. 0.081
   
   Answer:____________________________

2. 2.6
   
   Answer:____________________________

3. \(\frac{7}{12}\)
   
   Answer:____________________________

4. \(\frac{23}{50}\)
   
   Answer:____________________________

5. \(4\frac{2}{5}\)
   
   Answer:____________________________
4. Applications with percents, decimals, and fractions

Example 4. Complete the table.

<table>
<thead>
<tr>
<th>Percent</th>
<th>Fraction</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$\frac{3}{20}$</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>0.55</td>
</tr>
</tbody>
</table>

2. A family decides to spend no more than 27.5% on its monthly income on rent. Write 27.5% as a decimal and a fraction.

Decimal: _______________

Fraction: _______________
Sec. 7.2 Solving Percent Problems with Equations

Learning Objectives:
1. Write percent problems as equations.
2. Solve percent problems.
3. Key Vocabulary: of, is, what number, percent equation.

1. Write percent problems as equations

Formula: \( a = pb \) where \( a = \) amount (number after the word “is”, \( p = \) percent and \( b = \) base (number after the word “of”)

Key words:

“of” means

“is” means

“what” means

“\%” means

“what percent” means

Example 1. Translate to an equation. Use \( n \) to indicate the unknown. Do not solve.

1. 12\% of 80 is what number?

Answer: ______________________

2. 1.8 is what percent of 9?

Answer: ______________________

2. Solve percent problems

Example 2. Use equation to solve the following percent problems.

1. 210 is what percent of 60?

Answer: ______________________
2. What number is $15\frac{3}{4}\%$ of 50?

Answer:____________________________

3. 22.5% of what number is 2.7?

Answer:____________________________
Sec. 7.3 Solving Percent Problems with Proportions

Learning Objectives:
1. Write percent problems as proportions.
2. Solve percent problems.
3. Key Vocabulary: percent (p), base (b), amount(a), percent proportion

1. Write percent problems as proportions
Percent Proportion:

\[
\frac{p}{100} = \frac{\text{amount}}{\text{base}} \implies \frac{p}{100} = \frac{a}{b}
\]

Example 1. Translate to a proportion. Use \( n \) to indicate the unknown. Do not solve.

1. 50% of 24 is what number?

Answer:____________________________

2. What percent of 40 is 14?

Answer:____________________________

2. Solve percent problems

Example 2. Use proportions to solve the following percent problems

1. 15% of what number is 60?

Answer:____________________________

2. 15 is what percent of 90.

Answer:____________________________


**Learning Objectives:**

1. Solve applications involving percent.
2. Find the percent of increase and percent decrease.
3. Key Vocabulary: percent increase, percent decrease.

1. **Solve applications involving percent**

   **Example 1.** Solve.

   1. 15% of Carol’s check of $1200 is paid towards health care. How much money is paid towards health care?

       Answer: ____________________

   2. During a recent inspection, the fire department found 112 faulty smoke alarms. If this is 0.08% of the total inspected, how many smoke alarms were inspected?

       Answer: ____________________

   3. One day, 18 students were out sick with the flu. What percent of the students were absent if there should be a total of 80 students in the class?

       Answer: ____________________


2. **Find the percent of increase and percent decrease**

**Steps: to find percent increase or decrease:**
1. Find the amount of increase or amount of decrease
2. Use proportion to find the percent increased or percent decreased.

\[
\frac{p}{100} = \frac{\text{amount increased or amount decreased}}{\text{original amount}}
\]

New price = original price + amount increased

**Example 2.** Solve.

1. Recently, a bookstore announced that all their books would increase in price 5%. How much will a book cost if the original price was $4.50. Round to the nearest cent.

Answer: __________________________

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2. The price of a car decrease from $20000 to $15000 after just 500 miles of used. What is the percent depreciation for the car?

Answer: __________________________
Learning Objectives:
1. Calculate sales tax and total price.
2. Calculate commissions.
3. Calculate discount and sale price.
4. Key Vocabulary: sales tax, sales tax rate, total price, commission, commission rate, amount of discount, sale price.

1. Calculate sales tax and total price
Formula:
1. Sales tax = Purchase price × Tax rate
2. Total price = Purchase price + Sales tax

Example 1. Find the sales tax and the total price on the purchase of a $230 DVD player where the sales tax rate is 6.5%.

Sales tax:____________________________

Total price:____________________________

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Example 2. The sales tax on a $1050 computer system is $63. What is the sales tax rate?

Sales tax rate:_______________________

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2. Calculate commissions
Formula: Commission = commission rate × sales
**Example 3.** A book salesman is paid a commission of 3% of her monthly sales. For the month of August, she sold $180,000 worth of books. What was the amount of her commission for the month?

Commission: ____________________________

3. **Calculate discount and sale price**

   **Formula:**
   1. Amount of discount = Original price $\times$ discount rate
   2. Sale Price = Original price – amount of discount

**Example 4.** Find the amount discount and the sale price when the original price is $58 and the discount rate is 9%.

   Amount discount : ______________________

   Sale price: ___________________________
Sec. 7.6 Percent and Problem Solving: Interest

Learning Objectives
1. Calculate simple interest and total amount.
2. Key Vocabulary: simple interest; principal; rate; time; total amount of a loan

1. Calculate simple interest and total amount

Definitions:
Interest—is money charged for using other people’s money.
Principal (amount)—the money borrowed, loaned, or invested.
Interest Rate—is the percent used in computing the interest
Simple Interest—is the amount earned per year from the money borrowed, loaned, or invested.
Total amount (paid or received) = principal + interest

Formula:
\[ I = P \cdot r \cdot t \]
where \( I \) = amount of interest earned (in terms of $) \n\( r \) = interest rate (in terms %); \( t \) = time

Example 1. Solve.

1. Upon graduation, Tania is given money that totals $4,700. If this money is invested at 9.5% simple interest for 7 years, find the interest and the total amount.

Interest:________________________________

Total amount:________________________________

2. $250,000 is borrowed to buy a house. If the simple interest rate on the 30-year loan is 6.75%, find the interest and the total amount paid on the loan.

Interest:________________________________

Total amount:________________________________