



## What Is This Module About?

Have you ever received discounts on the prices of goods because you bought in bulk or large quantities? Have you ever been given reasonable discounts by store owners for continually patronizing their stores? Have you been to a store holding a sale with prices of goods 25% off or 30% off?

Have you experienced selling something for someone such that you are offered a percentage of the selling price if you are able to sell the goods? Have you ever earned money through commissions?

Given such situations, would you know how to compute for discounted prices? Do you know how to compute how much income you will receive from commissions?

In this module, you will learn how to compute for percentages as applied to discounts, commissions, interest, and other applications.

This module is divided into two lessons:

Lesson 1 – *What is Percent?*

Lesson 2 – *Solving Percentage Problems*



## What Will You Learn From This Module?

After studying this module, you should be able to:

- ◆ explain the meaning of *percent*;
- ◆ identify the relationship of percentages to ratios, decimals and fractions;
- ◆ change fractions to percent and vice versa; and
- ◆ solve problems involving percentages.



## Wait!

Before studying this module, you should have studied the modules *Learning About Fractions, Multiplication and Division of Decimals* and *Ratio and Proportion*.



## Let's See What You Already Know

Before starting with the lessons of this module, answer the following test questions. This will determine what you already know about the topic.

1. Convert 7.5% to a decimal.
  
  
  
  
  
  
  
  
  
  
2. Convert the following to percent.
  - a. 0.009
  
  
  
  
  
  
  
  - b.  $\frac{42}{100}$
  
  
  
  
  
  
  
  - c.  $\frac{3}{4}$
  
  
  
  
  
  
  
  - d.  $\frac{5}{9}$

3. Aling Auring sold 18 out of 24 whole chickens. What percent of the chickens were sold?
  
  
  
  
  
  
  
  
  
  
4. A furniture shop was offering a 20% discount on the items they were selling. If a wooden table originally costs P2,380.00, what is its discounted price?

Well, how was it? Do you think you fared well? Compare your answers with those in the *Answer Key* on pages 37–39.

If all your answers are correct, very good! This shows that you already know much about the topics in this module. You may still study the module to review what you already know. Who knows, you might learn a few more new things as well.

If you got a low score, don't feel bad. This means that this module is for you. It will help you understand important concepts that you can apply in your daily life. If you study this module carefully, you will learn the answers to all the items in the test and a lot more! Are you ready?

You may now go to the next page to begin Lesson 1.

## What is Percent?

The word **percent** means parts per hundred or a hundredth. The symbol “%” is used to express percent. Percent is used to express what part of the total number of test takers passed the NFE A&E Test. Percent may also be used to express the interest rate when we borrow money from the cooperative or from the bank. It is also used to express the discount on the price of a sale item in a department store.

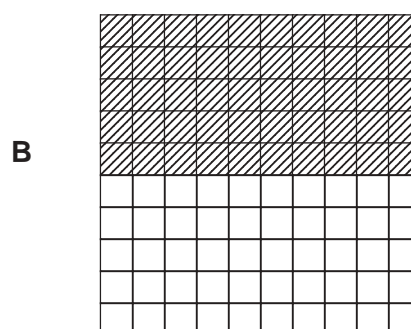
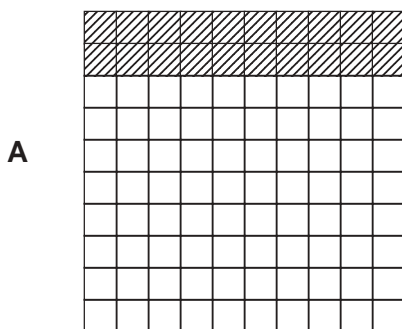
After studying this lesson, you should be able to:

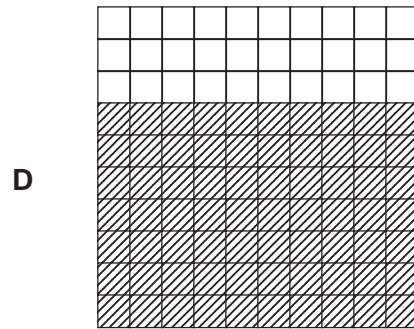
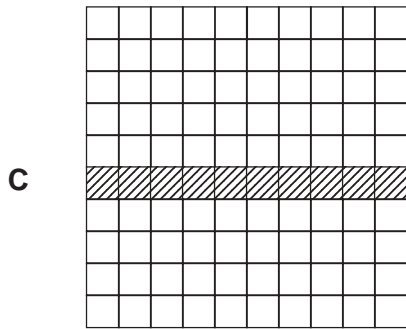
- ◆ explain the meaning of percent;
- ◆ identify the relationship of percent with ratio, fraction and decimal;
- ◆ convert percent to fractions and vice-versa;
- ◆ convert percent to decimals and vice-versa;
- ◆ solve problems involving percent;
- ◆ compute for the percentage if given a percent of a number.



### Let's Study and Analyze

Let's study and analyze the figures below by answering the questions that follow.





1. How many squares are shaded in each figure?
2. What is the ratio of the shaded part to all the squares?
3. What percent of the squares are shaded?

Let's put our answers in a table for a clearer presentation.

Figure	Number of Shaded Squares	Ratio
A	20	20 : 100
B	50	50 : 100
C	10	10 : 100
D	70	70 : 100

The above illustration shows that percent is a ratio with 100 as a second term.

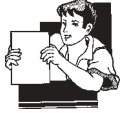
Suppose the second term of a given ratio is not 100, like 40: 400, 36: 300 or 35:700. These can be written as a ratio with 100 as the second term by dividing both terms by a number that will make the second term 100.

Let's study and analyze these.

$$1. \quad \frac{40:400}{4} = 10 : 100 \text{ in percent form is } 10\%$$

$$2. \quad \frac{36:300}{3} = 12 : 100 \text{ in percent form is } 12\%$$

$$3. \quad \frac{35:700}{7} = 5 : 100 \text{ in percent form is } 5\%$$



## Let's Learn

To help you understand the concept of percent, here are some examples:

1. 40% of the tomatoes in the basket are green. It means that out of every 100 tomatoes, 40 are green.
2. 60% of the population are women. It means that out of every 100 persons, 60 are women.
3. 75% of NFE learners are young adults. It means that out of every 100 NFE learners, 75 are young adults.



## Let's Try This

Give the meaning of the following statements.

1. 20% of the books are mathematics books. This means that

---

---

2. 50% of the trees are fruit trees. This means that

---

---

3. 60% of the furniture are made of wood. This means that

---

---

4. 25% of the plants are flowering plants. This means that

---

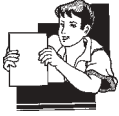
---

5. 15% of the harvested corn are infested with insects. This means that

---

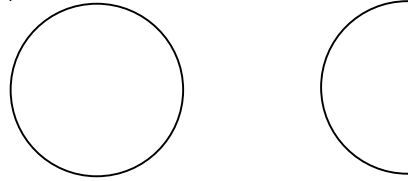
---

Compare your answers with those found in the *Answer Key* on page 39.



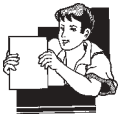
## Let's Learn

What does it mean when the value of a percent exceeds 100? For example, what does it mean when you say 150%? To help us understand, let us assume that 100% represents a whole pie. 50% represents half of the pie.



$$150\% = 100\% + 50\%$$

This means that 150% of a pie is one whole pie and a half. When the value of a percent exceeds 100%, it means that the percent value is greater than one whole.



## Let's Learn

### Changing Percent to Decimal

When we get to solve problems on percentages, it is important that we know how to convert percents to decimals and vice versa. For example, if a shirt costs P 125.00 and you were able to get a 10% discount, how would you know how much less you are going to pay? To compute for the answer, you need to convert the percent into decimal form first. Hence, we need to learn and practice how to convert percents into decimals.

Let's learn how to change percent to decimal by analyzing the examples given below.

**EXAMPLE 1** Convert 6% to a decimal.

**STEP 1** Remove the % sign and place 100 in the denominator.

$$6\% \Rightarrow \frac{6}{100}$$

**STEP 2** Divide the numerator by the denominator.

$$100 \overline{)6}$$

- ◆ There are two ways of performing the division.

**Solution 1**

$$\begin{array}{r} 0.06 \\ 100 \overline{)6.00} \\ \underline{6.00} \\ 0 \end{array}$$

- ◆ Divide 6 by 100 = 0.
- ◆ Put a decimal point to the right of 6 and cipher 2 zeros
- ◆ Divide 60 by 100 = 0.
- ◆ Divide 600 by 100 = 6
- ◆ Put the decimal point in the quotient

**Solution 2**

$$100 \overline{)6}$$

- ◆ Cancel the 2 zeros in the divisor by dividing both divisor and dividend by 100 so as not to change their original values.

$$\left(\frac{100}{100}\right) \div \left(\frac{6}{100}\right) \rightarrow 100 \div .06$$

$$100 \overline{).06}$$

- ◆ Any number divided by 1 equals the same number.

Notice that by dividing the numerator by 100, the decimal point is placed two decimal places to the left.

With this explanation, we can say that to change percent to decimal, remove the % sign and put the decimal point two places to the left.



**EXAMPLE 2** Convert 34% to a decimal.

Remove the % sign and put the decimal point two places to the left.

$$34\% \rightarrow 34 \rightarrow .34$$

**EXAMPLE 3** Convert 15% to a decimal.

$$15\% \rightarrow 15 \rightarrow .15$$

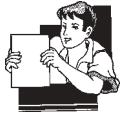


## Let's Try This

Convert the following percents to decimals using the methods shown in examples 2 & 3.

1. 29%
  
  
  
  
  
  
  
  
  
  
2. 5.8%
  
  
  
  
  
  
  
  
  
  
3. 215%

Compare your answers with those found in the *Answer Key* on page 39.



## Let's Learn

### Changing Decimal to Percent

We have learned how to convert percents to decimals. Now we need to know how to convert decimals to percents. This skill is important in solving many percentage problems.

For example, if 5 students out of 20 got a perfect score on a test, how would you know what percent of the class got a perfect score? The last step in the computation of this problem involves converting the decimal into a percent.

This time let's learn how to convert decimal to percent by analyzing the examples given below.

**EXAMPLE 1** Convert 0.02 to a percent.

**STEP 1** Multiply 0.02 by 100.

$$0.02 \rightarrow 0\ 0\ 2. \text{ or } 2$$

$$\begin{array}{r} 0.02 \\ \times 100 \\ \hline 002.00 \text{ or } 2 \end{array}$$

Notice that the decimal point was moved two places to the right. From this example, we can say that to change decimal to percent, we just move the decimal point two places to the right and affix the percent sign. (%).

**STEP 2** Affix the % sign.

$$2 \rightarrow 2\%$$

**EXAMPLE 2** Convert 3.1 to a percent.

$$3.1 \rightarrow 3\ 1\ 0. \rightarrow 310\%$$

**EXAMPLE 3** Convert .25 to a percent.

$$.25 \rightarrow .2\ 5. \rightarrow 25\%$$



## Let's Try This

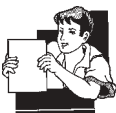
Convert the following decimals to percents using the steps described in the previous examples.

1. 0.824

2. 0.07

3. 1.2

Compare your answers with those found in the *Answer Key* on page 39.



## Let's Learn

### Changing Fractions to Percent

#### Situation 1

A Math test has 100 items. Lita was able to answer 90 items correctly. What percent of the test did Lita answer correctly?

We say: 90 out of 100 or  $\frac{90}{100} = 90\%$

Suppose Jose got 80 correct answers. What percent is that?

$$\frac{80}{100} = 80\%$$

If a fraction has 100 as the denominator, just write the numerator and affix the % sign. Then, drop the denominator.

Thus,  $\frac{60}{100} = 60\%$

$\frac{22}{100} = 22\%$

## Situation 2

There are 10 males and 15 females in a learning group. What % of the learning group are males? What % are females?

- a. We write our first answer as:  $\frac{10}{25}$  of the learners are males.

The denominator of the fractions is not 100. How do we get an equal fraction whose denominator is 100?

$$\frac{10}{25} = \frac{10 \times 4}{25 \times 4} = \frac{40}{100}$$

What number was multiplied to the numerator and the denominator? Why do you think this number was used?

Hence,  $\frac{10}{25} = \frac{40}{100}$  in percent form is 40%.

Therefore, 40% are males.

- b. What % are females?

We write our answer as  $\frac{15}{25}$ . Again, the denominator of the fraction is not 100. How do we get an equal fraction whose denominator is 100.

$$\frac{15}{25} = \frac{15 \times 4}{25 \times 4} = \frac{60}{100} = 60\%$$

Again we multiplied 4 to the numerator and denominator to get 100 in the denominator.

Therefore, 60% are females.

Remember, in changing a fraction whose denominator is not 100 but is a factor of 100, multiply the numerator and denominator by another factor that will give you a product of 100 in the denominator. In the above examples, 25 is a factor of 100. The other factor to be multiplied to both numerator and denominator in order to get a product of 100 in the denominator is 4.

### Situation 3

Suppose the fraction has a denominator that is not a factor of 100. Let's study the following example.

- a. Out of 30 mangoes, 21 are green. What percent of the total mangoes are green?

#### Solution:

**STEP 1** Write the fraction:

$$\frac{\text{Part}}{\text{Whole}} = \frac{21}{30}$$

The denominator is neither 100 nor a factor of 100.

**STEP 2** Divide the numerator (21) by the denominator (30).

$$\begin{array}{r} 0.7 \\ 30 \overline{)21.0} \\ \underline{210} \quad \rightarrow (30 \times 7 = 210) \\ 0 \quad \rightarrow (210 - 210 = 0) \end{array}$$

The quotient is 0.7, a decimal.

**STEP 3** Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

$$0.7 \rightarrow 70 \rightarrow 70 \%$$

Therefore, 70% of the mangoes are green.

- b. Carlo has an allowance of ₱36. If he spends ₱9 for his fare, what percent of his allowance does he spend for his fare?

**Solution:**

**STEP 1** Write the fraction.

$$\frac{\text{Part}}{\text{Whole}} = \frac{9}{36}$$

Again the denominator is neither 100 nor a factor of 100.

**STEP 2** Divide the numerator by the denominator.

$$\begin{array}{r} .25 \\ 36 \overline{)9.00} \\ \underline{72} \phantom{00} \\ 180 \\ \underline{180} \\ 0 \end{array}$$

The quotient is .25, a decimal.

**STEP 3** Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

Fractions whose denominator is neither 100 nor a factor of 100 can be changed to percent using these steps:

1. Write the fraction:  $\frac{\text{Part}}{\text{Whole}}$
2. Divide the numerator by the denominator – the resulting quotient is a decimal.
3. Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.



## Let's Try This

1. Change the following fractions to percent. Show your solution.

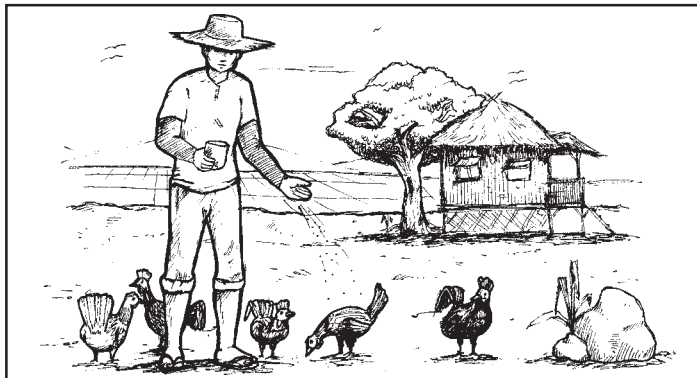
a.  $\frac{30}{100}$

b.  $\frac{3}{4}$

c.  $\frac{4}{5}$

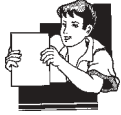
2. Solve for the following problems using the step by step procedure learned in the previous section of this lesson

a. Mang Elias raises chickens. He has 48 chickens in all. What percent of his chickens are hens if he has 30 hens in all?



b. Aling Trining made 16 baskets. If she was able to sell 12 baskets, what percent of the total baskets were sold?

Compare your answers with those found in the *Answer Key* on pages 40–41.



## Let's Learn

### Percent and Percentage

Recall that you can write percents as decimals or fractions. Can you fill up the table below?

Percent	Fraction
1. 8%	$\frac{8}{100}$
2. 52%	
3. 37%	
4. 90%	

Compare your answers with the table below.

Percent	Fraction
1. 8%	$\frac{8}{100}$
2. 52%	$\frac{52}{100}$
3. 37%	$\frac{37}{100}$
4. 90%	$\frac{90}{100}$



Here is a problem that applies what you have just learned about percents.

In a spelling test of 50 words, Lulu got 90% of the words correctly. How many words did she spell correctly?

There are 2 ways of solving this problem. Find out which solution is easier for you.

### Solution 1

Use the decimal equivalent of 90%.

$$\begin{aligned} 90\% &= .90 \\ &= .90 \times 50 \\ &= \frac{\begin{array}{r} .90 \\ \times 50 \\ \hline 45.00 \end{array}}{45.00} \end{aligned}$$

### Solution 2

Use the fraction equivalent of 90%.

$$\begin{aligned} 90\% &= \frac{90}{100} \text{ or } \frac{9}{10} \\ \frac{9}{10} \times 50 &= \frac{450}{10} \\ &= 45 \end{aligned}$$

Therefore, Lulu spelled 45 out of the 50 words correctly.

Percentage is the result of finding the percent of a number. In this problem, 45 is the percentage; it is 90% of 50.



## Let's Try This

- Find the percentage by changing the percent to decimal.
  - 8% of 55
  - 40% of 83
- Find the percentage by changing the percent to fractions.
  - 75% of 105
  - 20% of 29

Compare your answers with those in the *Answer Key* on pages 41–42.



## Let's Remember

- ◆ A percent means part per hundred or a hundredth. It is a ratio with 100 as the second term.
- ◆ When the value of a percent exceeds 100%, it means that the percent value is greater than one whole.
- ◆ To change a percent to a decimal, remove the % sign and then move the decimal point two places to the left.
- ◆ To change a decimal to a percent, move the decimal point two places to the right and add a % sign.
- ◆ To change a fraction whose denominator is a factor of 100 to percent, multiply both numerator and denominator by another factor that will give you a product of 100 in the denominator. Then, affix the % sign in the numerator and drop the denominator.
- ◆ A fraction whose denominator is neither 100 nor a factor of 100 can be changed to percent by using the following method:

1. Write the fraction :  $\frac{\text{Part}}{\text{Whole}}$

2. Divide the numerator by the denominator—the resulting quotient is a decimal.
3. Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

- ◆ A percentage is the result of finding a certain percent of a number.
- ◆ To find the percentage of a number, change the percent to its equivalent decimal or fraction.



## Let's See What You Have Learned

A. Give the meaning of the following statements. (1 point each)

1. 82% of the houses in the barangay have electricity. This means that \_\_\_\_\_  
\_\_\_\_\_

2. 39% of the children in the community are malnourished. This means that \_\_\_\_\_  
\_\_\_\_\_

B. Complete the table.

	<b>Percent</b>	<b>Decimal</b>	
1.	44%		
2.	6.3%		
3.	124 %		

C. Convert the following decimals to percent. (1 point each)

1. 0.004

2. 3.7

3. 0.581



# Solving Percentage Problems

In the previous lesson, you learned some important concepts about percentages. You are now ready to solve word problems involving percent. These include problems on commissions, discounts, interest, profits and others. Most of the applications of percentages concern money transactions.

After studying this lesson, you should be able to solve percentage problems on commissions, discounts, interests, taxes and others.



### Let's Read

*Commissions* are incentives given by employers to salespeople for selling products or services. The more products or services a salesperson can sell, the more money he or she will get from commissions. The story below will help us learn more about commissions.

Aling Rosa is a saleslady in a department store. She is stationed at the clothes area of the store. Aside from her fixed daily wage, she earns by getting commissions for every shirt she is able to sell.



She is given a 15% commission for every shirt that she is able to sell. One day, she was able to sell shirts worth a total ₱1,400.00. How much would Aling Rosa's commission be?

Since she gets a 15% commission from her total sales, her commission is 15% of ₱1,400.00, which is equal to ₱210.00.



## Let's Study and Analyze

How do we know that 15% of ₱1,400.00 is ₱210.00? Let us study how to solve percentage problems. Solving problems involving percentage becomes easier if you follow this formula:

$$P = B \times r$$

Where:  $P$  = percentage  
 $B$  = base, this represents the whole or original amount  
 $r$  = rate (it should be expressed in decimal form)

Let us try applying the formula in computing for the commission problem above.

**STEP 1** Write the given information.

- a. ₱1,400.00 – Aling Rosa's total sales; this represents the base.
- b. 15% – rate

**STEP 2** Determine what is asked.

Find how much Aling Rosa's commission ( $P$ ) is

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the amount Aling Rosa gets as her commission;  $B$  represents the total sales (₱ 1,400.00); and  $r$  represents the commission rate (15%). Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 1,400.00 \times 15\%$$

↓                  ↓  
Base              Rate

- b. Convert the rate from percent to decimal form.

$$r = 15\% \rightarrow 15 \rightarrow .15$$

- c. Compute for the percentage ( $P$ ).

$$P = 1,400 \times 0.15$$

$$\begin{array}{r} 1,400 \\ \times 0.15 \rightarrow 2 \text{ decimal places} \\ \hline 7000 \\ 1400 \\ \hline 210.00 \end{array} \left. \vphantom{\begin{array}{r} 1,400 \\ \times 0.15 \\ \hline 7000 \\ 1400 \\ \hline 210.00 \end{array}} \right\} \begin{array}{l} \text{Add the partial products} \\ \text{Put the decimal point two places to the left} \end{array}$$

$$P = 1,400.00 \times 0.15 = 210.00$$

Therefore, Aling Rosa's commission is ₱ 210.00.



## Let's Solve This Problem

Try solving the following problems below. The steps for the first problem have been given to guide you.

### Problem 1

Lester is a salesman at an appliance center. He gets a 12% commission for his sales. If he was able to sell appliances with a total worth of ₱13,600.00, how much is his commission?

**STEP 1** Write the given information.

**STEP 2** Determine what is asked.

Find how much Lester's commission ( $P$ ) is.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .
  
- b. Convert the rate in percent to decimal.
  
- c. Compute for the percentage ( $P$ ).

### **Problem 2**

Arlene is a saleslady in a shoe store. She gets a commission of 18% from her sales. If her total sales amounted to ₱7,300.00, how much commission will she get?

Compare your answers with those found in the *Answer Key* on pages 45–46.





## Let's Study and Analyze

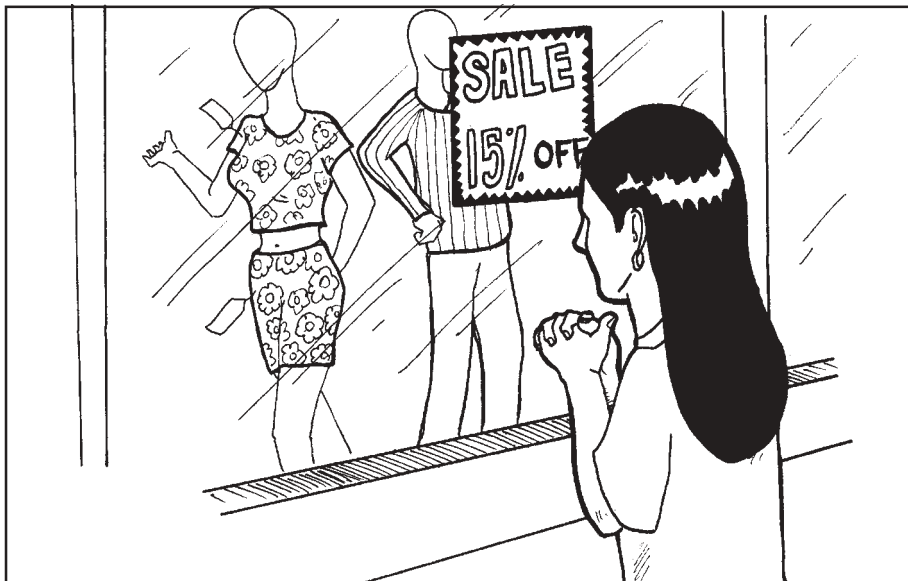
Let us now study other types of percentage problems—discounts, interests, and taxes. A sample problem will be provided for each type.

### Discounts

A *discount* is an amount deducted from the price of a commodity or service. Discounts are usually given by many stores during some occasions to encourage customers to buy their products or acquire their services, since these are offered at lower prices.

#### Problem 1

Aida wanted to buy a new dress. One day, she saw a dress that she liked very much. However, she discovered that she did not have enough money to buy it. She wished that the store would offer the dress a discounted price during their monthly sale.



When Aida returned to the store, she was surprised to see the dress being offered at a 15% discount. Aida did not waste time; she bought the dress. If the dress was originally priced at ₱795.00, how much did Aida pay for the dress if it was offered at a 15% discount?

**STEP 1** Write the given information.

- ₱795.00 – price of the dress; this represents the base (***B***).
- 15% – discount rate

**STEP 2** Determine what is asked.

Find the amount that Aida paid for the dress (the discounted price)

**STEP 3** Solve for the answer.

a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the discount Aida gets;  $B$  represents the original price (₱795.00); and  $r$  represents the discount rate (15%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc}
 P = 795.00 \times 15\% & & \\
 \downarrow & & \downarrow \\
 \text{Base} & & \text{Rate}
 \end{array}$$

b. Convert the rate from percent to decimal

$$r = 15\% \rightarrow 15 \rightarrow .15$$

c. Compute for the percentage ( $P$ ).

$$\begin{array}{r}
 P = 795 \times .15 \\
 \begin{array}{r}
 795 \\
 \times 0.15 \rightarrow 2 \text{ decimal places} \\
 \hline
 3975 \\
 795 \\
 \hline
 11925
 \end{array} \\
 \left. \begin{array}{l} 3975 \\ 795 \end{array} \right\} \text{Add the two partial products} \\
 \text{Put decimal point 2 places to the left}
 \end{array}$$

$$P = 795 \times .15 = 119.25$$

d. Compute for the discounted price.

$$\begin{array}{r}
 \overset{6}{\text{P}} \overset{18}{\text{9}} \overset{14}{\text{5}} \overset{9}{.00} \\
 - 195.25 \\
 \hline
 \text{P } 599.75
 \end{array}$$

Therefore, Aida paid only ₱599.25 for the dress.

## Interest

**Interest** is a charge made on borrowed money. Interest is charged when you make a loan. When you deposit money in the bank for a certain time, interest will be paid to you for putting your money there.

### Problem 2

Mang Lino deposited ₱12,600.00 in a bank. If the bank offers an 8% interest rate per year, how much money will Mang Lino have in the bank after a year?



**STEP 1** Write the given information.

- a. ₱ 12,600.00 – the amount Mang Lino deposited in the bank; this represents the base (***B***).
- b. 8% – interest rate

**STEP 2** Determine what is asked.

Find how much money Mang Lino will have in the bank after one year.

**STEP 3** Solve for the answer.

a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the interest or amount earned from Mang Lino's deposited money;  $B$  represents the money deposited (P12,600.00); and  $r$  represents the interest rate (8%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc} P = 12,600.00 \times 8\% & & \\ \downarrow & & \downarrow \\ \text{Base} & & \text{Rate} \end{array}$$

b. Convert the rate from percent to decimal

$$r = 8\% \rightarrow 08 \rightarrow .08$$

c. Compute for the percentage ( $P$ ).

$$P = 12,600 \times 0.08$$

$$\begin{array}{r} 12,600 \\ \times 0.08 \rightarrow 2 \text{ decimal places} \\ \hline 1008.00 \end{array} \quad \text{Put decimal point 2 places to the left}$$

$$P = 12,600 \times .08 = 1,008.00$$

$P$  is equal to 1,008.00 which is the total interest earned from Mang Lino's deposited money after one year.

d. Compute for the total amount of money Mang Lino will have in the bank after one year.

$$\begin{array}{r} \text{P } 12,600.00 \\ + 1,008.00 \\ \hline \text{P } 13,608.00 \end{array}$$

Therefore, Mang Lino will have P13,608.00 in the bank after a period of one year.

## Taxes

*Tax* is another application of percentages. A *tax* is a compulsory contribution to the government for the country's expenses raised from people's salaries. This means that when you earn money, the government is entitled to a part of your earnings. This is so that the government will have funds for its services, projects and expenses.

### Problem 3

Sammy works in an office and has a taxable income of ₱ 87,523.00 for this year. How much tax does he have to pay if the tax rate is 12%?

**STEP 1** Write the given information.

- a. ₱ 87,523.00 – Sammy's taxable income; this represents the base (**B**).
- b. 12% – tax rate

**STEP 2** Determine what is asked.

Find out the amount of tax that Sammy has to pay.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the tax to be paid by Sammy;  $B$  represents Sammy's taxable income; and  $r$  represents the tax rate (12%). Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 87,523.00 \times 12\%$$

$\downarrow$   
Base

$\downarrow$   
Rate

- b. Convert the rate to decimal form if it is not yet in decimal form.

$$r = 12\% \rightarrow 12 \rightarrow .12$$

- c. Compute for the percentage ( $P$ ).

$$P = 87,523 \times .12$$

$$\begin{array}{r}
 87,523 \\
 \times .12 \\
 \hline
 175046 \\
 87523 \\
 \hline
 \text{P } 10,502.76
 \end{array}$$

$\rightarrow$  2 decimal places  
 $\}$  Add the two partial products  
 Put the decimal point two places to the left

$$P = 87,523 \times .12 = \text{P } 10,502.76$$

$P$  is equal to P10,502.76 which represents the total amount of tax Sammy has to pay this year.



## Let's Review

Solve the following word problems on percentages.

- Mario was planning to buy a television set he saw in a local appliance center, but it cost P8,625.00 and was too expensive for his budget. One day, the appliance center offered a 20% discount on the television set. How much is the discounted price of the television set?

**STEP 1** Write the given information.

**STEP 2** Determine what is asked.

**STEP 3** Solve for the answer.

- To solve for the answer, use the formula  $P = B \times r$ .

- b. Convert the discount rate from percent to decimal
  
  - c. Compute for the percentage (*P*).
  
  - d. Compute for the discounted price of the television set.
2. Aling Edna borrowed money from her local cooperative to help her set up her own sari-sari store. The cooperative loaned her ₱14,600.00 to be paid in six months. She was charged 7% interest for the loan. How much will she have to pay the cooperative after six months?
3. Mrs. Gomez is a public school teacher. Her taxable income for this year is ₱56,253.00. If the tax rate is 12%, how much will she have to pay in taxes?

Compare your answers with those found in the *Answer Key* on pages 47–50.



## Let's Remember

- ◆ Word problems on percentage can be solved using the formula

$$P = B \times r$$

where  $P$  = percentage

$B$  = base, this represents the whole or original amount

$r$  = rate (it should be expressed in decimal form)

- ◆ *Commissions* are incentives given by employers to salespeople for being able to sell products or services.
- ◆ A *discount* is an amount deducted from the price of a commodity or service to encourage the customers to avail of them at lower prices.
- ◆ An *interest* is a charge made on borrowed money.
- ◆ A *tax* is a compulsory contribution to the government for the country's expenses that is raised from people's income.



## Let's See What You Have Learned

Answer the following word problems.

1. Edna is a saleslady in a souvenir shop. She gets a 12% commission for her sales. If she was able to sell products worth a total of ₱4,825.00, how much is her commission?



2. After being a regular customer of a hardware store, Martin came to know the store's owner. Because he regularly patronized the hardware store, the owner decided to give him an 8% discount on all items he buys. If he bought items worth ₱ 2,870.00, how much is his discount?
  
  
  
  
  
  
  
  
  
  
  
3. Mang Jimmy deposited ₱11,950.00 in a bank. If the interest rate per year is 9%, how much will his bank savings be after one year?
  
  
  
  
  
  
  
  
  
  
  
  
  
4. Miss Luis is a secretary in a government office. She earns ₱95,950.00 in a year. How much will be deducted from her annual income if the tax rate is 13%?

Compare your answers with those found in the *Answer Key* on pages 50–54.

If your test score is:

- 4 Excellent! You have understood the lesson well.
- 3 Review the items in the lesson which you did not understand.
- 0–2 You must study the whole lesson again.



## Let's Sum Up

- ◆ *Percent* means per hundred or a hundredth. It is a ratio with 100 as a second term.
- ◆ When the value of a percent exceeds 100%, it means that the percent value is greater than one whole.
- ◆ To change a percent to a decimal, remove the % sign and then move the decimal point two places to the left.
- ◆ To change a decimal to a percent, move the decimal point two places to the right and add a % sign.
- ◆ To express parts of a whole in percent, the formula below is used.

$$Y = \frac{\text{Part}}{\text{Whole}} \times 100\%$$

where  $Y$  represents the part of a whole in percent.

- ◆ Word problems on percentage can be solved using the formula

$$P = B \times r$$

where  $P$  = percentage

$B$  = base, this represents the whole or original amount

$r$  = rate (it should be expressed in decimal form)



## What Have You Learned?

1. In her Math test, Lita got 36 items correct out of 45 items. What was her percentage score?
2. There were originally 30 trees on Mang Anding's land. 6 trees were cut down to clear a portion of the land. What percent of the trees on Mang Anding's land were cut down?
3. Danny is a salesman selling computers. He gets a 14% commission for his sales. If he was able to sell a computer worth ₱29,450.00, how much was his commission?
4. A shoe store offered a 20% discount on all items. A pair of shoes originally cost ₱ 995.00. What is the discounted price?

5. Mr. Cruz applied for a loan at a local bank. He borrowed ₱ 17,500.00 loaned at an interest rate of 9%. This was to be paid in 9 months. How much will Mr. Cruz pay after 9 months?

Compare your answers with those found in the *Answer Key* on pages 55–59.

If your test score is from:

- 5      Excellent! You have understood the lessons of the module well.
- 4–3    Review the lessons in the module which you did not understand.
- 0–2    You must study the whole module again.



## Answer Key

### A. Let's See What You Already Know (pages 2–3)

1.  $7.5\% \rightarrow 7.5 \rightarrow .075$

a.  $0.009 \rightarrow 0.0\underset{\curvearrowright}{0}.9 \rightarrow .9\%$

b.  $\frac{42}{100} \rightarrow 42\%$

c.  $\frac{3}{4} \rightarrow \frac{3 \times 25}{4 \times 25} = \frac{75}{100} = 75\%$

d.  $\frac{5}{9} \rightarrow 9\overline{)5} \rightarrow 9\overline{)5.00}$   
 $\begin{array}{r} .55 \\ 9\overline{)5.00} \\ \underline{45} \\ 50 \end{array}$

$.55 \rightarrow 55 \rightarrow 55\%$

3. **STEP 1** Write the fraction:  $\frac{\text{Part}}{\text{Whole}} = \frac{18}{24}$

a. total number of chickens (whole) – 24

b. number of chickens sold (part) – 18

**STEP 2** Divide the numerator (18) by the denominator (24).

a.  $\begin{array}{r} 0.75 \\ 24\overline{)18.00} \\ \underline{168} \phantom{00} \rightarrow (24 \times 7 = 168) \\ 120 \phantom{00} \\ \underline{120} \phantom{00} \rightarrow (5 \times 24 = 120) \\ 0 \phantom{00} \rightarrow (120 - 120 = 0) \end{array}$

The quotient is 0.75.

- b. Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

$$0.75 \rightarrow \underset{\%}{75}. \quad 75\%$$

Therefore 75% of the chickens were sold.

4. **STEP 1** Write the given information.

- a. ₱2,380.00 – price of the wooden table; this represents the base (***B***).
- b. 20% – discount rate

- STEP 2** Determine what is asked.

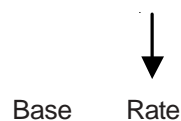
Find the discounted price of the table.

- STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case, ***P*** represents the amount to be discounted from the original price of table; ***B*** represents the original price (₱2,380.00); and ***r*** represents the discount rate (20%). Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 2,380.00 \times 20\%$$



- b. Convert the rate to decimal form if it is not in decimal form already.

$$r = 20\%$$

To convert from percent to decimal, remove the % sign and then put the decimal point two places to the left.

$$r = 20\% = .20$$

c. Compute for the percentage ( $P$ ).

$$P = 2,380 \times 0.2$$

$$\begin{array}{r} 2,380 \\ \times 0.2 \\ \hline 476. \end{array} \quad \begin{array}{l} \text{1 decimal place} \\ \text{Put the decimal point one place to the left} \end{array}$$

$$P = 2,380 \times 0.2 = 476$$

$P$  is equal to 476 which means that the price of the table is ₱ 476.00 less than the original price. The discounted price of the table is:

$$\begin{array}{r} \phantom{₱} 2,380 \\ - \phantom{₱} 476 \\ \hline \phantom{₱} 1,904 \end{array}$$

## B. Lesson 1

*Let's Try This (page 6)*

1. This means that out of every 100 books, 20 are mathematics books.
2. This means that out of every 100 trees, 50 are fruit bearing.
3. This means that out of every 100 pieces of furniture, 60 are made of wood.
4. This means that out of every 100 plants, 25 are flowering plants.
5. This means that out of every 100 pieces of harvested corn, 15 are infested with insects.

*Let's Try This (page 9)*

1. 29%  $\rightarrow$  29  $\rightarrow$  .29
2. 5.8%  $\rightarrow$  5.8  $\rightarrow$  .058
3. 215%  $\rightarrow$  215  $\rightarrow$  2.15

*Let's Try This (pages 11)*

1. 0.824  $\rightarrow$  0.8  $\overline{2}$  4 or 82.4  $\rightarrow$  82.4%
2. 0.07  $\rightarrow$  0.0  $\overline{7}$   $\rightarrow$  7  $\rightarrow$  7%
3. 1.2  $\rightarrow$  1.2  $\overline{0}$   $\rightarrow$  120  $\rightarrow$  120%

*Let's Try This (page 15)*

1. a.

$$\begin{aligned} \text{b. } \frac{3}{4} &= \frac{3 \times 25}{4 \times 25} \\ &= \frac{75}{100} \\ &= 75\% \end{aligned}$$

$$\begin{aligned} \text{c. } \frac{4}{5} &= \frac{4 \times 20}{5 \times 20} \\ &= \frac{80}{100} \\ &= 80\% \end{aligned}$$

2. a. **STEP 1** Write the fraction:  $\frac{\text{Part}}{\text{Whole}} = \frac{30}{48}$

**STEP 2** Divide the numerator (30) by the denominator (48).

$$\begin{array}{r} 0.625 \\ 48 \overline{)30.000} \\ \underline{288} \quad \rightarrow (48 \times 6 = 288) \\ 120 \quad \rightarrow (300 - 288 = 12; \text{bring down } 0 = 120) \\ \underline{96} \quad \rightarrow (48 \times 2 = 96) \\ 240 \quad \rightarrow (120 - 96 = 24; \text{bring down } 0 = 240) \\ \underline{240} \quad \rightarrow (48 \times 5 = 240) \\ 0 \quad \rightarrow (240 - 240 = 0) \end{array}$$

The quotient is 0.625.

**STEP 3** Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

$$.625 \rightarrow \underline{62.5} \rightarrow 62.5\%$$

Therefore 62.5% of Elias's chickens are hens.



b. **STEP 1** Write the fraction.

**STEP 2** Divide the numerator by the denominator.

$$\begin{array}{r}
 0.75 \\
 16 \overline{)12.00} \rightarrow 120 \div 16 = 7 \\
 \underline{112} \quad \rightarrow 7 \times 16 = 112 \\
 80 \quad \rightarrow 120 - 112 = 8; \text{bring down } 0 \\
 \underline{80} \quad \rightarrow 5 \times 16 = 80 \\
 0 \quad \rightarrow 80 - 80 = 0
 \end{array}$$

The quotient is .75.

**STEP 3** Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

$$.75 \rightarrow \underline{.75} \rightarrow 75\%$$

*Let's Try This (page 17)*

$$\frac{\text{Part}}{\text{Whole}} = \frac{12}{16}$$

1. a. 8% of 55

$$\begin{aligned}
 8\% &= .08 \\
 &= .08 \times 55
 \end{aligned}$$

$$\begin{array}{r}
 4 \\
 55 \\
 \times .08 \\
 \hline
 4.40
 \end{array}$$

$$8\% \text{ of } 55 = 4.4$$

b. 40% of 83

$$\begin{aligned}
 40\% &= .40 \\
 &= .40 \times 83
 \end{aligned}$$

$$\begin{array}{r}
 1 \\
 83 \\
 \times .40 \\
 \hline
 33.20
 \end{array}$$

$$40\% \text{ of } 83 = 33.2$$

2. a. 75% of 105

$$\begin{aligned}
 75\% &= \frac{75}{100} = \frac{75 \div 25}{100 \div 25} = \frac{3}{4} \\
 &= \frac{3}{4} \times 105 \\
 &= \frac{315}{4}
 \end{aligned}$$

$$75\% \text{ of } 105 = 78.75$$

$$\begin{array}{r}
 78.75 \\
 4 \overline{)315.00} \\
 \underline{28} \\
 35 \\
 \underline{32} \\
 30 \\
 \underline{28} \\
 20 \\
 \underline{20} \\
 0
 \end{array}$$

b. 20% of 29

$$\begin{array}{r} 5.8 \\ 5 \overline{)29.0} \\ \underline{25} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

$$20 \% \text{ of } 29 = 5.8$$

*Let's See What You Have Learned (pages 19–20)*

- A. 1. This means that out of every 100 houses in the barangay, 82 houses have electricity.
2. It means that out of every 100 children, 39 are malnourished.

B.

<b>Percent</b>	<b>Decimal</b>	
1. 44%	0.44	
2. 6.3%	0.063	
3. 124 %	1.24	

- C. 1.  $0.004 \rightarrow 0.00\dot{4} \rightarrow .4\%$
2.  $3.7 \rightarrow 37\dot{0} \rightarrow 370\%$
3.  $0.581 \rightarrow 0.58\dot{1} \rightarrow 58.1\%$

D. 1. **STEP 1**

**STEP 2** Divide the numerator (18) by the denominator (30).

$$\begin{array}{r} 0.6 \\ 30 \overline{)18.0} \\ \underline{18.0} \rightarrow (30 \times 6 = 180) \\ 0 \rightarrow (180 - 180 = 0) \end{array}$$

The quotient is 0.6.

**STEP 3** Change the decimal to percent by moving the decimal point 2 places to the right. Then affix the % sign.

$$0.6 \rightarrow 0.60 \rightarrow 60\%$$

Therefore 60% of the goats were sold.

Write the fraction :  $\frac{\text{Part}}{\text{Whole}} = \frac{13}{52}$  **STEP 1** Write the fraction :  $\frac{\text{Part}}{\text{Whole}} = \frac{13}{52}$

**STEP 2** Divide the numerator (13) by the denominator (52).

$$\begin{array}{r} 0.25 \\ 52 \overline{)13.00} \\ \underline{104} \rightarrow (52 \times 2 = 104) \\ 260 \rightarrow (130 - 104 = 26; \text{bring down } 0 = 260) \\ \underline{260} \rightarrow (52 \times 5 = 260) \\ 0 \rightarrow (260 - 260 = 0) \end{array}$$

The quotient is 0.25.

c. Change the decimal to percent by moving the decimal point 2 places to the right. Then, affix the % sign.

$$.25 \rightarrow .25 \rightarrow 25\%$$

Therefore 25% of the voters voted for Aling Trining.

3. There are two ways of solving this problem:

**Solution 1**

80% of ₱450

$$\begin{array}{r} \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \times \phantom{.} \phantom{0} \phantom{0} \\ \hline 360.00 \end{array}$$

80% of ₱450 = ₱360

**Solution 2**

80% of ₱450

$$\begin{aligned} 80\% &= \frac{80}{100} = \frac{80 \div 20}{100 \div 20} = \frac{4}{5} \\ &= \frac{4}{5} \times 450 \end{aligned}$$

$$\begin{array}{r} \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \phantom{\times} \phantom{.} \phantom{0} \phantom{0} \\ \times \phantom{.} \phantom{0} \phantom{0} \\ \hline 1800 \end{array} \quad \frac{1800}{5} \rightarrow \begin{array}{r} \phantom{3} \phantom{6} \phantom{0} \\ 5 \overline{)1800} \\ \underline{15} \phantom{0} \\ 30 \\ \underline{30} \\ 0 \end{array}$$

80% of ₱450 = ₱360

Therefore, ₱360 of the budget was spent.

## C. Lesson 2

*Let's Solve This Problem (pages 23–25)*

### Problem 1

**STEP 1** Write the given information.

- ₱13,600.00 – total sales; this represents the base.
- 12% – rate

**STEP 2** Determine what is asked.

Find how much Lester's commission ( $P$ ) is.

**STEP 3** Solve for the answer.

- To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the amount Lester gets as his commission;  $B$  represents the total sales (₱13,600.00); and  $r$  represents the commission rate (12%).

Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 13,600.00 \times 12\%$$

↓            ↓  
Base        Rate

- Convert the rate in percent to decimal

$$r = 12\% \rightarrow 12 \rightarrow .12$$

- Compute for the percentage ( $P$ ).

$$P = 13,600 \times .12$$

$$\begin{array}{r} 13,600 \\ \times .12 \rightarrow 2 \text{ decimal places} \\ \hline 27200 \\ 13600 \\ \hline 1632.00 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} \text{Add the two partial products} \\ \text{Put the decimal point two places to the left} \end{array}$$

$$P = 13,600.00 \times .12 = 1,632.00$$

Therefore, Lester's commission is ₱1,632.00.

## Problem 2

**STEP 1** Write the given information.

- a. ₱ 7,300.00 – total sales; this represents the base.
- b. 18% – rate

**STEP 2** Determine what is asked.

Find how much Arlene's commission ( $P$ ) is.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the amount Arlene gets as her commission;  $B$  represents the total sales (₱7,300.00); and  $r$  represents the commission rate (18%).

Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc} P = 7,300.00 \times 18\% & & \\ \downarrow & & \downarrow \\ \text{Base} & & \text{Rate} \end{array}$$

- b. Convert the rate from percent to decimal

$$r = 18\% \rightarrow 18 \rightarrow .18$$

- c. Compute for the percentage ( $P$ ).

$$P = 7,300 \times .18$$

$$\begin{array}{r} 7,300 \\ \times .18 \rightarrow \text{2 decimal places} \\ \hline 58400 \\ 7300 \\ \hline 1314.00 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Add two partial products}$$

Put the decimal point two places to the left

$$P = 7,300.00 \times .18 = \text{₱ } 1,314.00$$

Therefore, Arlene's commission is ₱ 1,314.00.

*Let's Review (pages 30–31)*

1. **STEP 1** Write the given information.

- a. ₱ 8,625.00 – original price of the television set
- b. 20% – rate

**STEP 2** Determine what is asked.

Find how much the discounted price of the television set (**P**) is.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case, **P** represents the amount Mario gets as discount; **B** represents the original price (₱ 8,625.00); and **r** represents the discount rate (20%). Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 8,625.00 \times 20\%$$

↓  
Base    Rate

- b. Convert the discount rate from percent to decimal.

$$r = 20\% \rightarrow 20 \rightarrow .20$$

- c. Compute for the percentage (**P**).

$$P = 8,625 \times .20$$

$$\begin{array}{r} \overset{1}{8},\overset{1}{6}25 \\ \times .20 \\ \hline 1,725.00 \end{array} \rightarrow \begin{array}{l} \text{2 decimal places} \\ \text{Put the decimal point one place to the left} \end{array}$$

$$P = 8,625.00 \times .2 = 1,725.00$$

Therefore, Mario's discount is ₱1,725.00.

- d. Compute for the discounted price of the television set.

$$\begin{array}{r}
 8,625 \rightarrow \text{original price} \\
 - 1,725 \rightarrow 20\% \text{ discount} \\
 \hline
 \text{P } 6,900 \rightarrow \text{discounted price}
 \end{array}$$

The discounted price of the television set is P 6,900.00

2. **STEP 1** Write the given information.

- a. P 14,600.00 – amount loaned to Aling Edna; this represents the base.  
 b. 7% – interest rate

- STEP 2** Determine what is asked.

Find how much Aling Edna will have to pay the cooperative after 6 months (P).

- STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the interest that Aling Edna has to pay;  $B$  represents the money loaned (P14,600.00); and  $r$  represents the interest rate (7%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc}
 P = 14,600.00 \times 7\% & & \\
 \downarrow & & \downarrow \\
 \text{Base} & & \text{Rate}
 \end{array}$$

- b. Convert the interest rate from percent to decimal.

$$r = 7\% \rightarrow 07 \rightarrow .07$$

- c. Compute for the percentage ( $P$ ).

$$P = 14,600 \times .07$$

$$\begin{array}{r}
 14,600 \\
 \times .07 \\
 \hline
 1,022.00
 \end{array}$$



$P = 14,600.00 \times .07 = 1,022.00$ —interest on the money borrowed

d. Compute for the total amount to be paid by Aling Edna.

14,600.00	–	amount loaned
+ 1,022.00	–	interest
<hr/>		
₱ 15,622.00		

Therefore, Aling Edna will have to pay the cooperative ₱ 15,622.00 after 6 months.

3. **STEP 1** Write the given information.

a. ₱ 56,253.00 – Miss Gomez’s taxable income; this represents the base.

b. 12% – tax rate

**STEP 2** Determine what is asked.

Find how much tax Miss Gomez will pay this year ( $P$ ).

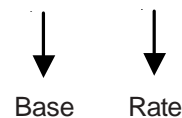
**STEP 3** Solve for the answer.

a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents amount of tax to be paid by Miss Gomez’s taxable income and  $r$  represents the commission rate (12%).

Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 56,253.00 \times 2\%$$



b. Convert the tax rate from percent to decimal.

$$r = 12\% \rightarrow 12 \rightarrow .12$$

c. Compute for the percentage ( $P$ ).

$$P = 56,253 \times .12$$

$$\begin{array}{r}
 56,253 \\
 \times 0.12 \rightarrow \text{2 decimal places} \\
 \hline
 112^1506 \\
 562\ 53 \\
 \hline
 \text{P}6,750.36
 \end{array}
 \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Add the two partial products}$$

Put the decimal point two places to the left

$$P = 56,253 \times .12 = \text{P}6,750.36$$

Therefore, Miss Luis will have to pay  $\text{P}6,750.36$  in taxes this year.

*Let's See What You Have Learned (pages 32–33)*

1. **STEP 1** Write the given information

- a. 12% – Edna's commission rate for her sales
- b.  $\text{P}4,825$  – Edna's total sales

**STEP 2** Determine what is asked

Find out how much Edna's commission amounts to

**STEP 3** Solve for the answer

- a. To solve for the answer, use the formula

$$P = B \times r$$

In this case,  $P$  represents the total amount that Edna gets as her commission;  $B$  represents Edna's total sales ( $\text{P}4,825$ ) and  $r$  represents the commission rate (12%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc}
 \text{P} = 4825 \times 0.12 & & \\
 \downarrow & & \downarrow \\
 \text{Base} & & \text{Rate}
 \end{array}$$

b. Convert the rate from percent to decimal:

$$r = 12\% \rightarrow 12 \rightarrow .12$$

c. Compute for the percentage ( $P$ )

$$P = 825 \times .12$$

$$\begin{array}{r} 4825 \\ \times 0.12 \rightarrow 2 \text{ decimal places} \\ \hline 9650 \\ 4825 \phantom{0} \\ \hline 579.00 \end{array} \quad \begin{array}{l} \text{Add the partial products} \\ \text{Put the decimal point two places to the left} \end{array}$$

$$P = 4,825 \times .12 = \text{₱}579.00$$

Therefore, Edna's commission is ₱579.00.

2. **STEP 1** Write the given information

a. 8% – Martin's discount at the hardware store

b. ₱ 2,870 – Martin's total purchases

**STEP 2** Determine what is asked

Find how much discount Martin got for the items he bought.

**STEP 3** Solve for the answer

a. To solve for the answer, use the formula

In this case,  $P$  represents the discount Martin gets;  $B$  represents the total value of all the purchases (₱ 2,870) and  $r$  represents the discount rate (8%). Substituting the values in the formula  $P = B \times r$ , we have:

$$P = 2,870 \times 8\%$$

↓            ↓  
Base        Rate

b. Convert the rate from percent to decimal:

$$8\% \rightarrow 8 \rightarrow .08$$

c. Compute for the percentage (P).

$$P = 2,870 \times .08$$

$$\begin{array}{r} 2,870 \\ \times \quad .08 \\ \hline 229.60 \end{array} \begin{array}{l} \rightarrow 2 \text{ decimal places} \\ \rightarrow \text{Put the decimal point two places to the left} \end{array}$$

d. Compute for amount paid by Martin.

$$\begin{array}{r} 2,870.00 \\ - \quad 229.60 \\ \hline \text{P } 2,640.40 \end{array}$$

Therefore, Martin paid only ₱2,640.40 for the items he bought.

3. **STEP 1** Write the given information

- a. 9% – The interest rate applied to Mang Jimmy's deposit
- b. ₱ 11,590 – the amount of money Mang Jimmy deposited in the bank

**STEP 2** Determine what is asked

Find out how much Mang Jimmy's bank savings will be after one year.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$

In this case,  $P$  represents how much Mang Jimmy's savings account will be after one year;  $B$  represents the amount of money in Mang Jimmy's savings account at present (P11,950) and  $r$  represents the interest rate (9%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc} P = 11,950 \times 9\% & & \\ \downarrow & & \downarrow \\ \text{Base} & & \text{Rate} \end{array}$$

- b. Convert the rate from percent to decimal form:

$$9\% \rightarrow 9 \rightarrow .09$$

- c. Compute for the percentage (P).

$$P = 11,950 \times .09$$

$$\begin{array}{r} 11950 \rightarrow 2 \text{ decimal places} \\ \times \quad .09 \rightarrow \text{Put the decimal point two places to the left} \\ \hline 1075.50 \end{array}$$

- d. Compute for the total amount in Mang Jimmy's bank account after one year

$$\begin{array}{r} \text{P} 11,950 \\ + \quad 1,075 \\ \hline \text{P} 13,025 \end{array}$$

Therefore, the total amount of money in Mang Jimmy's bank account after one year will be ₱ 13,025.

4. **STEP 1** Write the given information

a. 13% – The tax rate on Miss Luis’s income

b. ₱ 95,950 – Miss Luis’s annual income

**STEP 2** Determine what is asked

Find out how much income tax Miss Luis has to pay

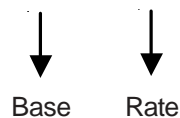
**STEP 3** Solve for the answer

a. To solve for the answer, use the formula

$$P = B \times r$$

In this case, *P* represents the amount of tax Miss Luis has to pay; *B* represents Miss Luis’s annual salary (₱ 95,950) and *r* represents the income tax rate (13%). Substituting the values in the formula  $P = b \times r$ , we have:

$$P = 95,960 \times 13\%$$



b. Convert the rate from percent to decimal form:

$$13\% \rightarrow 13 \rightarrow 0.13$$

c. Compute for the percentage (P)

$$P = 95,950 \times .13$$

$\begin{array}{r} \overset{121}{95,950} \\ \times 0.13 \\ \hline 287850 \\ 95950 \\ \hline \end{array}$	<p>→ 2 decimal places</p> <p>} Add the two partial products</p> <p>Put the decimal point two places to the left</p>
$\text{₱ } 12473.50$	

Therefore, Miss Luis has to pay ₱ 12,473.50 in taxes.

## D. What Have You Learned? (pages 35–36)

1. **STEP 1** Write the fraction.

$$\frac{\text{Part}}{\text{Whole}} = \frac{36}{45}$$

- STEP 2** Divide the numerator (36) by the denominator (45).

$$\begin{array}{r} 0.8 \\ 45 \overline{)36.0} \\ \underline{36.0} \\ 0 \end{array} \rightarrow (45 \times 8 = 360)$$

$$\rightarrow (36 - 36 = 0)$$

The quotient is 0.8.

- STEP 3** Change the decimal to percent by moving the decimal point two places to the right. Then affix the % sign.

$$.8 \rightarrow \underbrace{80}_{\text{}} \rightarrow 80\%$$

Therefore Lita got a percentage score of 80%.

2. **STEP 1** Write the fraction.

$$\frac{\text{Part}}{\text{Whole}} = \frac{6}{30}$$

- STEP 2** Divide the numerator (6) by the denominator (30).

$$\frac{6}{30} \rightarrow \frac{6 \div 10}{30 \div 10} = \frac{.6}{3}$$

$$30 \overline{)6} \rightarrow \begin{array}{r} / \\ \hline \end{array}$$

The quotient is .2.

$$\begin{array}{r} .2 \\ 30 \overline{)6} \\ \underline{6} \\ 0 \end{array}$$

**STEP 3** Change the decimal point to percent by moving the decimal point two places to the right. Then affix the % sign.

$$.2 \rightarrow 20. \rightarrow 20\%$$

Therefore, 20% of the trees were cut down.

3. **STEP 1** Write the given information.

a. ₱ 29,450.00 –price of computer Danny sold;  
this represents the base.

b. 14% – commission rate

**STEP 2** Determine what is asked.

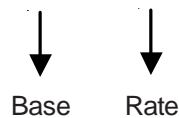
Find how much commission Danny gets (**P**).

**STEP 3** Solve for the answer.

a. To solve for the answer, use the formula  $P = B \times r$ .

In this case, **P** represents the commission Danny gets; **B** represents Danny's sales (P29,450.00); and **r** represents the commission rate (14%). Substituting the values in the formula  $P = B \times r$  becomes:

$$P = 29,450.00 \times 14\%$$



b. Convert the rate from percent to decimal

$$r = 14\% \rightarrow 14 \rightarrow .14$$

c. Compute for the percentage (**P**).

$$P = 29,450 \times .14$$

$$\begin{array}{r}
 \begin{array}{r}
 \phantom{0}^3 \phantom{0}^1 \phantom{0}^2 \\
 29,450 \\
 \times 0.14 \\
 \hline
 117800 \\
 29450 \\
 \hline
 \text{₱ } 4,123.00
 \end{array}
 \end{array}$$

→ 2 decimal places

} Add the two partial products

Put the decimal point two places to the left



$$P = 4,123.00 \times 0.14 = 4,123.00$$

Therefore, Danny will get a commission worth ₱ 4,123.00.

4. **STEP 1** Write the given information.

- a. ₱ 995.00—cost of the pair of shoes; this represents the base.
- b. 20% – discount rate

**STEP 2** Determine what is asked.

Find the discounted price of the pair of shoes.

**STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula

$$P = B \times r.$$

In this case, **P** represents the discount; **B** represents the original pair of shoes ₱ 995.00; and **r** represents the discount rate (20%). Substituting the values in the formula  $P = B \times r$  becomes:

$$P = 995.00 \times 20\%$$

- b. Convert the discount rate from percent to decimal.

$$r = 20\% \rightarrow 20 \rightarrow .20 \text{ or } .2$$

- c. Compute for the percentage (**P**).

$$P = 995 \times .2$$

$$\begin{array}{r} 995 \\ \times .2 \quad \text{1 decimal place} \\ \hline 199.0 \end{array} \quad \text{Put the decimal point one place to the left}$$

₱ 199.00 is the discount.

- d. Compute for the discounted price of the pair of shoes.

$$\begin{array}{r} \phantom{P} 88 \\ \phantom{P} 995.00 \\ - 199.00 \\ \hline P 796.00 \end{array}$$

Therefore, the discounted price of the pair of shoes is ₱ 796.00.

5. **STEP 1** Write the given information.

- a. ₱17,500.00 – money Mr. Cruz borrowed from a bank; this represents the base.  
b. 9% – interest rate

- STEP 2** Determine what is asked.

Find how much Mr. Cruz will pay after 9 months.

- STEP 3** Solve for the answer.

- a. To solve for the answer, use the formula  $P = B \times r$ .

In this case,  $P$  represents the interest;  $B$  represents the money loaned (₱17,500.00); and  $r$  represents the interest rate (9%). Substituting the values in the formula  $P = B \times r$ , we have:

$$\begin{array}{ccc} P = 17,500.00 \times 9\% & & \\ \downarrow & & \downarrow \\ \text{Base} & & \text{Rate} \end{array}$$

- b. Convert the interest rate in percent to decimal.

$$r = 9\% \rightarrow 9 \rightarrow .09$$

- c. Compute for the percentage ( $P$ ).

$$P = 17,500 \times .09$$

$$\begin{array}{r} 17,500 \\ \times .09 \rightarrow 2 \text{ decimal places} \\ \hline 1,575.00 \end{array} \quad \text{Put the decimal point two places to the left}$$

$$P = 17,500. \times .09 = \text{P } 1,575.00$$

Therefore, the interest is  $\text{P } 1,575.00$ .

- d. Compute for the total amount Mr. Cruz will pay the bank.

Money borrowed + interest

$$\begin{array}{r} \text{P } 17,500.00 \\ + \quad 1,575.00 \\ \hline \text{P } 19,075.00 \end{array}$$