Objective Calculating Tips, Commissions, and Simple Interest

Warm-Up

Express each percent as a decimal and as a fraction.

1. 57%

Sample worked out

Percent to decimal

57% ⟶ 57%

Move the decimal place ONLY 2 places to the left

5.7.

0.57

Percent to Fraction

57% ⟶ $\frac{57}{100}$

The % symbol indicated that the demominator is 100

2. .7%

3. 22.5%

4. 0.015%

5. 3.79%

A room service waiter or waitress at a hotel receives an automatic gratuity that varies directly with the amount of the food bill.

1. Suppose a room service waitress at the Sun and Sand Resort receives gratuity represented by the equation g = 0.15b, where g represents the gratuity and b represents the food bill.

a. What percent gratuity does the room service waitress receive? How do you know?

b. If the food bill is $19, how much tip did she receive?

c. If the room service waitress receives a $2.10 gratuity, how much is the food bill?

2. Write an equation to represent the direct proportional relationship between the amount of gratuity (g) received by a room service waitress and the food bill (b). Let k represent the constant of proportionality. What does the constant of proportionality represent in this equation?

3. Gourmet Eatery has a policy of automatically adding an 18% tip to every restaurant bill.

a. Write an equation to represent the relationship between the tip (t) and the restaurant bill (b).

b. How much of a tip is added to a restaurant bill of $54? Use your equation to determine the amount of the tip.

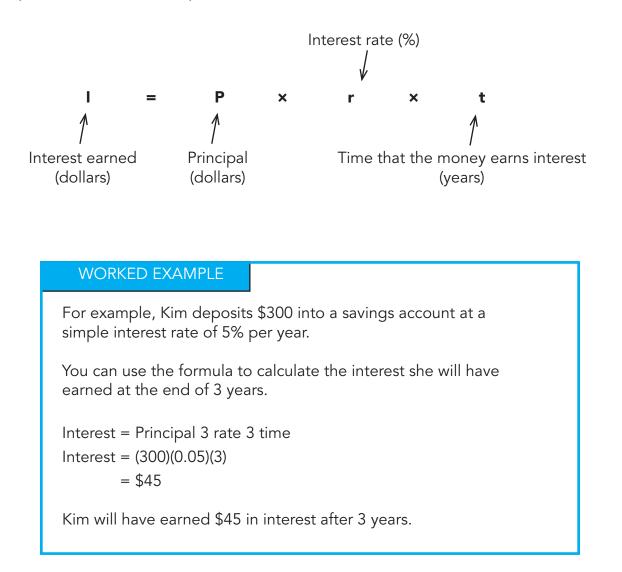**c. Marie receives a tip of $12. How much is the restaurant bill?**

d. If a restaurant bill is $12, how much is the tip?

e. How much would a restaurant bill be if it had a tip of $3.20 added to it?

When you save money in a bank savings account, the bank pays you money each year and adds it to your account. This additional money is interest, and it is added to bank accounts because banks routinely use your money for other financial projects. They then pay interest for the money they borrow from you.

An original amount of money in your account is called the principal. Interest is calculated as a percent of the principal. One type of interest is simple interest, which is a fixed percent of the principal. Simple interest is paid over a specific period of time—either twice a year or once a year, for example. The formula for simple interest is:

Interest rate (%)

$$I = P \times r \times t$$

Interest earned (dollars)   Principal (dollars)   Time that the money earns interest (years)

WORKED EXAMPLE

For example, Kim deposits $300 into a savings account at a simple interest rate of 5% per year.

You can use the formula to calculate the interest she will have earned at the end of 3 years.

Interest = Principal 3 rate 3 time

Interest = (300)(0.05)(3)

       = $45

Kim will have earned $45 in interest after 3 years.

1. Complete the table by using your knowledge of the formula for simple interest.

Principal Amount Saved (dollars)	Interest Rate	Time (years)	Interest Earned (dollars)
425	7%	5	
75	3%	1	
250	2%	8	
340	5%	2	
	4%	3	30.00
456	6%		109.44
500		4	120.00

In the same way that banks pay you interest when they use your money for financial projects, you too pay interest as well.

2. When you borrow money from a bank, the amount you borrow is the principal, and you pay the interest on that money to the bank. Complete the table shown.

Principal Borrowed (dollars)	Interest Rate	Time (years)	Interest Paid (dollars)
5000	6%	10	
450	5%	2	
1500	7%	3	
	2%	20	7200

Homework HW

Objective

For each commission situation, define variables for the varying quantities, write a percent equation to represent the relationship, and then answer the question. **SHOW ALL CALCULATIONS**

1. An automobile saleswoman earns 12% on all of her sales. Last month, she sold 3 cars for a total sales amount of $28,950.
What is her commission?

2. A real estate agent earns 6% of the selling price of each house he sells. If he sells a home for $250,000, how much of a commission will he make?