LIFEPAC®

Consumer Math

Student Book

Unit 6

Alpha Omega Publications®

CONSUMER MATHEMATICS 6
SERVICE OCCUPATIONS

CONTENTS

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SERVICE OCCUPATIONS

The service occupations comprise an increasingly important classification in terms of this nation's labor force. With the latest available data, the Bureau of Labor Statistics indicates that over 14 million people are employed in service-related jobs. The projected growth calls for a 55 per cent increase in this sector during the next ten years, the highest for any sector.

What are the service-related jobs? Specifically, the term *services* includes jobs engaged in necessary support activities. Examples are food services, protective services, automotive services, accounting services, insurance services, hotel services, and travel services, to name just a few.

Like any other occupation, these jobs require an understanding of basic mathematical principles and the ability to apply these principles in day-to-day activities. Therefore, as you proceed through this LIFEPAC, you will be exposed not only to fundamental mathematical operations but also to practical work-related applications. In an effort to fix firmly the principles in your mind, we shall provide you with meaningful practice in applying mathematical concepts and procedures.

OBJECTIVES

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAC.

When you have finished this LIFEPAC, you should be able

1. To figure change due in money transactions,
2. To figure the amount of sales tax,
3. To compute interest charges,
4. To figure discounts and markups,
5. To interpret data in tabular form,
6. To perform line-graph analysis,
7. To perform bar-graph analysis,
8. To estimate service facility capacity,
9. To apply correct mathematical operations in specific occupations, and
10. To determine prices for services rendered.

Survey the LIFEPAC. Ask yourself some questions about this study. Write your questions here.

I. FINANCIAL TRANSACTIONS

OBJECTIVES

1. To figure change due in money transactions.
2. To figure the amount of sales tax.
3. To compute interest charges.
4. To figure discounts and markups.

Financial transactions are an essential part of service occupations. A great deal of service employees' exposure to the consumer is directly related to money and credit transactions. The ability to figure cash transactions, such as how to make change and total receipts, is fundamental to effective job performance.

Credit transactions are a little more complicated than cash transactions, in that one must work with percentages and fractions to compute interest charges and time payments.

CASH TRANSACTIONS INVOLVING CHANGE

This section tells how to make change, an important and common cash transaction.

> PROCEDURE
>
> To make change, subtract the total charges from the amount *tendered* in payment, and give back the difference in bills or coins or both.

Model 1: A woman gives her hairdresser a twenty-dollar bill when quoted a price of $7.50. How will the hairdresser make change?

Since the transaction is for $7.50 and a $20 bill has been tendered, the hairdresser will subtract $7.50 from $20.00 and return the difference to the customer.

Amount tendered = $20.00
Less your cost = −7.50
Change returned = $12.50

Model 2: You render a service for $8.75. You are given $10.00 in payment. How much should you return in change?

Amount tendered = $10.00
Less your cost = −8.75
Change returned = $ 1.25

Perform the following change calculations.

1.1 Charge is $12.82. The customer gave $15.00.

Compute the change. _____

1.2 Charge is $6.98. The customer gave $10.00.

How much change? _____

1.3 Charge is $3.84. The customer tendered $5.00.

Figure the correct change. _____

1.4 Price is $4.00. Find the amount of change due from a $5 bill tendered. _____

1.5 You charge $18.50 for a service. You are given a $20 bill. How much change should you give back?

_____

1.6 A customer's bill comes to $9.37. He gives you a $5 bill, five $1 bills, one nickel, and 2 pennies. How much change should you give back?

_____

SALES TAX

Most financial transactions involve a combination of payment for goods and services, plus a local sales tax. If you provide a service and sell some tangible goods, you are generally required by state and municipal laws to collect a tax. This tax is normally designated as a percentage of the sales price for the goods sold.

PROCEDURE

To determine how much tax to collect, multiply the tax rate stated in a percentage figure by the price of the merchandise. To obtain the total sales price, add the resulting tax figure to the price of the merchandise.

Model 1: How much sales tax should be added to the price of goods that sell for $15.00 if the tax rate is 6%?

$$\begin{aligned} \text{Price of goods} &= \$15.00 \\ &\times\ 0.06 \\ \text{Amount of tax} &= \$\ 0.90 \end{aligned}$$

Model 2: What is the total price charged for goods that cost $7.50 and have a 4% sales tax?

$$\begin{aligned} \text{Price of goods} &= \$7.50 \\ &\times\ 0.04 \\ \text{Amount of tax} &= \$0.30 \end{aligned}$$

Total price = $7.50 + 0.30 = $7.80.

Compute the sales tax for the following situations.

1.7 Price of goods is $13.00. Tax rate is 5%. How much is the sales tax? _____

1.8 Price of goods is $7.50. Tax rate is 6%. How much is the sales tax? _____

1.9 Price of goods is $7.95. Tax rate is 4%. How much should you collect in taxes? (Hint: Round to the nearest whole cent if third decimal place is 5 or larger.) _____

1.10 Your transaction involves $8.00 for services and $2.95 for goods provided. Tax rate is 5%. What is the total price quoted? (Hint: Only the price of goods is affected by the sales tax.) _____

1.11 You figure your services cost $13.00. You also provide your customer with goods costing $5.75. If you must also charge a 4% sales tax, what do you quote as the total price to the customer? _____

1.12 You charge $8.50 an hour to service a car. You sell to the customer 5 quarts of premium oil that costs $1.05 per quart. Sales tax is 6%. Your total service time amounts to 1½ hours. How much should you charge for labor and goods?

_____

INTEREST CHARGES

Whenever purchases are made on credit, *interest* is charged. Interest is the amount of money paid for the use of money. *Interest rates* are quoted as the rate per cent per unit of time of such a payment.

Truth-in-lending legislation requires the lender or extender of credit to quote not only the interest rate, but also the annual percentage rate and the finance charges in dollars. The interest rate, expressed in terms of a monthly rate, will frequently be lower than the annual percentage rate. We shall be concerned only with the annual percentage rate, which is the true annual interest rate.

PROCEDURE

To calculate the true annual interest rate, multiply two times the number of payments made in a year (y) by the total amount of interest charges (c); divide the result by the product of the amount financed (m) and the number of payments to be made over the life of the contract (n) plus one.

$$I = \frac{2(yc)}{m(n + 1)}$$

Model 1: Compute the true annual interest rate on an installment contract where the payments of \$28.50 are made monthly for a period of 36 months, and the amount financed is \$935.

Total payments made for 36 months = 36 x \$28.50 = \$1,026.

Total amount of interest = \$1,026 - 935 = \$91.

$$I = \frac{2(12 \times 91)}{935(36 + 1)} = \frac{2,184}{34,595}$$

Therefore, $I = 0.063$, or 6.3%.

Model 2: Compute the *principal* plus interest payments necessary to retire a note for \$1,000, if 24 equal monthly payments are made and a 7.5% true annual interest rate is charged.

$$I = \frac{2(yc)}{m(n + 1)}; \quad 0.075 = \frac{2(12 \times c)}{1,000(24 + 1)}$$

$$c = \frac{1,875}{24}$$

Therefore, c = \$78.13

Since the total interest charges amount to \$78.13,

$$\text{monthly payments} = \frac{1,000 + 78.13}{24}$$

$$= \$44.92.$$

Work the following true annual interest problems.

1.13 c = \$158.15; y = 12; m = \$2,500; n = 36. Find I.

1.14 c = \$88.18; y = 12; m = \$1,100; n = 18. Find I.

1.15 I = 18%; y = 12; m = \$600; n = 24. Find c.

1.16 I = 12%; y = 12; m = \$275; n = 18. Find interest charges.

1.17 A customer buys an automobile from you, the salesman. The price of the car, which includes taxes and license, amounts to \$5,955.00. The customer wants to finance the car over 48 months after making a \$500 down payment. You inform him that the true annual interest rate is 18%. He wants to know what his payments will be. What are the monthly payments (principal plus interest)?

1.18 Compute the true annual interest rate charged for a loan of \$3,500, paid off in 36 equal payments of \$104.50.

DISCOUNTS AND MARKUPS

Discounts and *markups* are widespread throughout businesses and occupations. Merchants habitually adjust list prices of their merchandise to increase sales, to provide incentives for cash payment, and to sell slow-moving goods. Merchants make these adjustments through a technique known as discounting. Discounting is deducting

a certain percentage of the amount of cost. Cash discounts are also given for early payment on credit accounts.

To establish the selling price of a commodity, the merchant employs the technique of markup. Markup is the percentage or amount added to the cost of his goods to take care of *profit* and *overhead*.

Even though both techniques employ a percentage increase or decrease, their correct applications can pose problems for the beginner. We will take each technique in turn.

PROCEDURE

To determine the amount of discount, multiply the list price by the percentage rate of the discount. To obtain the discount price, deduct the discount amount from the list price.

Model 1: A 10% discount is offered on a certain item that sells for $10.95. How much is the discount and what is the discounted sales price?

a. Amount of discount = (0.10)($10.95) = $1.10.

b. Discounted sales price = $10.95 - 1.10 = $9.85.

(Note: If you were interested only in the discounted sales price, you could find the answer directly by multiplying the retail price ($10.95) by (1 - 0.10): $10.95(0.90) = $9.85.)

Model 2: A store offers you a 2% discount if you pay your bill of $185 within ten days of billing. How much will you have to pay to take advantage of this discount?

Amount to pay = $185.00 - (0.02)(185)
= $185.00 - 3.70
= $181.30.

Model 3: The retail price on an article is $65.75. If you offer to sell it for $62.50, what percentage discount are you offering?

(% discount)($65.75) = $65.75 - 62.50

$$\% \text{ discount} = \frac{3.25}{65.75} = 0.0494 \text{ or } 5\%$$

PROCEDURE

To set a price when cost and desired markup as a percentage of a retail price are known, multiply the cost by the percent markup to give the markup dollar amount. Then add the dollar markup to the cost to give the selling price.

Price = (cost x % markup) + cost

cost x % markup = dollar amount of markup

selling price = markup dollar amount + cost

Model 1: A merchant wants to establish the selling price of an item that costs him $4.50 so that he will achieve a 15% markup. What is his selling price?

Price = ($4.50 x .15) + $4.50

Price = $0.68 + $4.50 = $5.18

Model 2: A good you wish to purchase is sale priced at $9.95. You find out that the list price for the same good is $9.15. What is the markup percentage used?

$9.95 = ($9.15 x % markup) + $9.15

$9.95 - $9.15 = $9.15 x % markup

$0.80 = $9.15 x % markup

$$\frac{\$0.80}{\$9.15} = .087 = 9\%$$

Compute the following discounts and markups.

1.19 Retail price = $15.75
Discount = 12.5%
How much is the discount? _____

1.20 Retail price = $4,595
Discount = 15%
How much is the discount? _____

1.21 Retail price = $475
Amount of discount = $45
What percentage discount is offered?

_____

1.22 Amount of discount = $35
Percentage of discount = 10%
What is the original list price?
(Hint: Divide amount of discount by discount rate.)

_____

1.23 An article sells for $415.80. You wish to discount it at 20%. At what price will you offer it after discount?

_____

1.24 You are offered an item for $17.85. The seller states he normally sells the same item for $19.95. What percentage discount is he offering you?

_____

1.25 Cost = $38.75
Desired markup = 10%
What is the price after markup?

_____

1.26 Cost = $138.25
Desired markup = 12.5%
What is the price after markup?

_____

1.27 Cost = $58.00
Price after markup = $63.00
What is the desired markup (percentage)?

_____

1.28 Price after markup = $75.50
Markup used = 5%
What is the cost?

_____

1.29 You see a used car you wish to buy. The dealer quotes you a price of $1,595. You have a blue book quotation of $1,435 for the same model and year. How much markup is the dealer using? _____

1.30 The flat rate of your service runs $6.50 per hour. To cover overhead, you charge a markup of 15% for the first 8 hours, and 10% on the second 8 hours. You estimate that a particular job will take you 16 hours. What price will you submit to your client? (Hint: Find the price with a 15% markup, and the price with a 10% markup. Add the two results together to get the total price.) _____

Review the material in this section in preparation for the Self Test. The Self Test will check your mastery of this particular section. The items missed on this Self Test will indicate specific areas where restudy is needed for mastery.

SELF TEST 1

Figure the change due in the following cash transactions (each answer, 3 points).

1.01 The bill is $19.43. Payment tendered is $20. How much change? _____

1.02 You charge a customer $62.48 for an article. He gives you a check for $100. How much change is due him?

_____

1.03 An item costs $42.28. All you have in cash are three $20 bills. How much change should you receive in the transaction? _____

Compute the sales tax on the following transactions (each answer, 3 points).

1.04 An article retails for $38.50. The city sales tax is 4%, and the federal excise tax is 7%. How much is the total tax? _____

1.05 A seat to a musical costs $5.50. To that amount must be added a 6% entertainment tax. How much money must you receive in total to give a customer a ticket?

_____

1.06 The total price of an article is $7.02, including tax. If the tax rate is 8%, what is the retail price of the article? _____

1.07 A certain car costs $6,595 before taxes are added. Taxes are $460 and license tags cost $55. What is the tax rate? _____

Compute the following true annual interest rate problems (each answer, 4 points).

1.08 Loan amount = $10,000
Monthly payments = $258.50
Time of loan contract = 5 years
True annual interest rate?

_____

1.09 Purchase price of article = $495
Down payment = $50
Number of payments = 36
True annual interest rate = 18%
Monthly payment amount?

_____

1.010 You purchase a cafeteria business for $15,000. You put $2,250 down and finance the rest to pay off the loan in 5 years at 12% true annual interest. What are your monthly payments to pay off the loan?

_____

Compute the discounts and markups for the following problems (each answer, 4 points).

1.011 Cost of article = $195
Retail price = $225
Percentage of markup?

_____

1.012 List price of article = $2,150
Percentage discount = 18%
Retail price?

_____

1.013 Cost of article = $455
Percentage of markup = 28%
Retail price?

_____

1.014 Retail price of article = $555
Percentage of markup = 35%
Cost of article?

_____

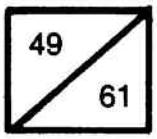
1.015 You offer to sell a used car for $1,895. Yesterday you purchased the car for $1,755. What percentage markup are you charging? _____

1.016 You sell and service vacuum cleaners. Your price on a particular model is $135. However, to get a service contract, you offer to sell it for $115. How much discount are you giving as a percentage?

_____

1.017 You sell an automobile part for $9.98, which includes a 4% sales tax. If the article cost you $8.75, what percentage markup are you charging?

_____




Score _____

Teacher check _____
Initial Date