

CONSUMER MATHEMATICS 6

SERVICE OCCUPATIONS

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3.16 No. of customers = 160
Meat served = chicken
How many pounds of chicken required?

3.17 No. of diners = 240
Meat served = meat with little bone
Amount of meat required?

3.18 Meat to be served = fish fillet
Amount of fish in stock = 86 lb.
How many customers can be served fish?
(3.5 persons per pound)

PERSONAL HEALTH SERVICES

This section explains how to determine the recommended protein intake for an average adult and how to determine the amount of calories used per mile of jogging.

PROCEDURE

To determine the recommended minimum protein intake in grams for the average adult: multiply the weight in pounds of the individual by 0.45. Now you have the individual's weight in kilograms. For each kilogram of weight, the intake should be 1 gram of protein.

Model 1: The weight of an adult woman is 125 lb.
How much protein should she intake?

Converted weight = $125 \times 0.45 = 56.25$ kg
Amount of protein = $56.25 \times 1 = 56.25$ g

Model 2: If a man intakes 65 g of protein daily,
his recommended intake, how much does
he weigh in pounds?

65 g protein = 65 kg of weight
Weight in pounds = $\frac{65}{0.45} = 144$ lb.

An important energy unit is the *calorie*. A calorie is the unit used to express the heat-producing, or energy-producing, value of food. Too many calories, of course, add extra fat to your body. You can watch your calorie intake when you eat and you can burn off excess calories through vigorous exercise. Jogging is a very popular method of exercising. As a rule of thumb, you may go by the following procedure to determine calorie loss from running.

PROCEDURE

The amount of calories used per mile of jogging is determined by an individual's weight and speed of running. If a person runs the mile in six minutes, his calorie-use factor is approximately $\frac{2}{3}$ of his weight. If he runs the mile in eight minutes, his calorie-use factor is 65% of his weight. If he runs the mile in ten minutes, his calorie-use factor is 62% of his weight. Note: Weight is left in pounds for calorie problems.

Model 1: A man weighs 180 lb. He jogs a mile in 10 minutes. How many calories has he used up?

Formula: Calories used = weight x use factor for 10-min.-mile
 $= 180 \times 0.62 = 112$

Model 2: A woman weighs 130 lb. She wishes to burn off 85 calories. Approximately how fast must she run a mile to do so?

Calorie use factor = $\frac{85}{130} = 65\%$

The 65% calorie use factor is associated with the 8-minute mile, so she must run the mile in eight minutes.

Perform the following calculations based on the personal appearance section.

3.19 Person = adult male
Weight = 165 lb.
How much protein should he intake?

- 3.20 Person = adult female
Weight = 112 lb.
How much protein should she consume?
-
- 3.21 Person = adult male
Amount of protein ingested = 69.75 g
How much does he weigh?
-
- 3.22 Weight of male = 174 lb.
Jogging speed = 1 mile in 6 minutes
How many calories used?
-
- 3.23 Weight of female = 135 lb.
Jogging speed = 1 mile in 10 minutes
How many calories used? Multiply the weight
by the use factor.
-
- 3.24 Calories burned off = 90
Weight of male = 139 lb.
Jogging speed? Divide the calories
burned by the weight, then determine
the corresponding speed.
-

PRICES FOR SERVICES RENDERED

One important aspect of working in the service occupations is determining a fair price for your services. Typically, such a price is made up of your direct labor cost, usually figured at an hourly rate; and the overhead rate, usually a percentage of the labor cost. The labor cost as an hourly rate must include labor costs such as pension, social security, insurance, and payroll taxes. The overhead rate pays for such things as rent, utilities, administrative costs, and equipment use and depreciation.

This section will not include how to determine overhead rates because they vary from business to business and from place to place. They must be added to the cost of labor to determine the total price for the services rendered.

PROCEDURE

To calculate the price for any job performed, multiply the hourly labor rate of the employee(s) involved by the number of hours worked and add overhead cost (usually expressed as a percent of the total labor cost); then add the cost of parts. Total job cost = hourly labor rate (no. hours worked) + overhead cost + cost of parts (or goods).

and hourly labor rate = $\frac{\text{total job cost} - (\text{overhead cost} + \text{cost of parts})}{\text{no. hours worked}}$

and overhead costs = overhead rate (hourly labor rate)(no. hours worked)

Model 1: You must give an estimate to service an automobile. The hourly rate for labor is \$7.50. You estimate the job will take $2\frac{1}{2}$ hours. The overhead rate at your shop is 85%. You also figure that parts to be used total \$25.50 retail. How much is the job estimate?

Labor costs = $\$7.50 \times 2\frac{1}{2} = \18.75

Overhead costs = $\$18.75 \times 0.85 = \15.94

Cost of parts = \$25.50

Estimate of total cost = $\$18.75 + 15.94 + 25.50$
= \$60.19

Model 2: A trained income tax preparer earns \$5.50 per hour. His overhead rate is 75%. If it takes 2 hours to complete the interview and the necessary paperwork, how much should the client pay? No charge is made for supplies used.

Cost of labor = $\$5.50 \times 2 = \11.00

Cost of overhead = $\$11.00 \times 0.75 = \8.25

Total charge = $\$11.00 + 8.25 = \19.25

Model 3: Your engine mechanics earn \$15.00 per hour. Your light-duty servicemen earn \$6.50 per hour. Assume a customer wants his engine tuned and oiled. Also he wants his auto greased. If the job takes $1\frac{1}{2}$ hours of a mechanic's time, $1\frac{1}{2}$ hours of a serviceman's time, and the overhead rate is 100%, what are the total labor plus overhead charges?

Cost of mechanic's labor = $\$15.00 \times 1\frac{1}{2} = \22.50

Cost of serviceman's labor = $\$6.50 \times 1\frac{1}{2} = \9.75

Total labor charges = $\$22.50 + 9.75 = \32.25

Cost of overhead = $\$32.25 \times 1.00 = \32.25

Total charges = $\$32.25 + 32.25 = \64.50

Work the following pricing problems for services rendered.

3.25 Labor rate = \$8.50 per hour
Labor time = $4\frac{3}{4}$ hours
Overhead rate = 85%
Retail price for parts = \$17.75
Total job cost ?

3.26 Labor rate = \$7.00 per hour
Labor time = 15 hours
Overhead rate = 110%
Retail price of parts = \$38.75
Total job cost?

3.27 Labor rate = \$8.00 per hour
Labor time = 6 hours
Retail price of parts = \$0
Total job cost = \$86.00
Overhead rate?
($\frac{\$86.00 - \text{labor cost}}{\text{labor cost}} \times 100$)

3.28 Hourly rate, worker A = \$15.00
Hourly rate, worker B = \$8.00
Hourly rate, worker C = \$5.25
Labor time, worker A = $2\frac{1}{2}$ hours
Labor time, worker B = 1 hour
Labor time, worker C = $\frac{3}{4}$ hour
Overhead rate = 75%
Retail price of parts = \$125.50
Total cost of job?

3.29 Labor time = $4\frac{1}{2}$ hours
Overhead rate = 95%
Retail price of parts = \$134.75
Total cost of job = \$241.98
What is hourly rate for labor?
($\frac{\text{total cost} - \text{parts cost}}{1.95 \times 4.5} = \text{hourly rate}$)



Before you take this last Self Test, you may want to do one or more of these self checks.

1. _____ Read the objectives. Determine if you can do them.
2. _____ Restudy the material related to any objectives that you cannot do.
3. _____ Use the SQ3R study procedure to review the material:
 - a. **S**can the sections,
 - b. **Q**uestion yourself again (review the questions you wrote initially),
 - c. **R**ead to answer your questions,
 - d. **R**ecite the answers to yourself, and
 - e. **R**evue areas you didn't understand.
4. _____ Review all activities, and Self Tests, writing a correct answer for each wrong answer.