

# Gross Pay

- 1.1 Hourly Pay and Salary
- 1.2 Average Pay
- 1.3 Regular and Overtime Pay
- 1.4 Commission
- 1.5 Other Wage Plans

## Statistical Insights

Category	Examples	Range of Hourly Compensation
White Collar	engineers, nurses, accountants, insurance agents, cashiers, hotel clerks, computer operators	\$14.34–\$33.12
Blue Collar	carpenters, electricians, truck drivers, material handlers, stockers, production inspectors	\$12.07–\$22.12
Service	security guards, nursing aides, janitors, barbers, food service	\$5.65–\$10.61

Use the data shown above to answer each question.

1. Is the data presented in a way that an average overall income can be figured? Explain.
2. Explain one reason why white collar compensations differ by \$18.78 and service compensations differ by only \$4.96.



## NetCheck

### Get Assistance—Online Career Search

**T**oday, in addition to looking for a job in the want ads or having an agency provide assistance, help is available on the Internet. Career search websites help to locate job openings. Someone looking for a job can post a resume, or a summary of your job qualifications, on the site. Potential employers can then view the resumes. When employers find a person whose qualifications match those required by their company, they contact the person using the information from the resume.

### Get Information—Is the Income Fair?

**I**f someone finds a job in another part of the country, the pay being offered needs to be in line with the cost of living in that region. Many Internet sites allow you to select a city and state and then compare the cost of living between two cities. Average income information is also available at these sites.

**RATE YOUR KNOWLEDGE** on a scale of 1–10  
(10 being the highest) about

- gross pay
- overtime pay
- earning wages based on commission

# 1.1

# Hourly Pay and Salary

## GOALS

- Calculate gross pay for hourly-rate employees
- Calculate gross pay for salaried employees

### Start Up

Sarah has a new job as an assistant manager in a shoe department. She will work 54 hours each week and earn \$15 an hour. For this work schedule and rate of pay, is it possible for Sarah's gross pay for one month to be at least \$3,750?



### Math Skill Builder

Review these math skills and solve the exercises that follow.

- 1 **Add** money amounts.

Find the sum.  $\$430 + \$95 = \$525$

1a.  $\$450 + \$76$

1b.  $\$1,600 + \$14,750$

- 2 **Multiply** money amounts by whole numbers.

Find the product.  $24 \times \$9 = \$216$

2a.  $35 \times \$8$

2b.  $52 \times \$355$

- 3 **Multiply** numbers with end zeros.

Find the product.  $20 \times \$310 = \$6,200$

3a.  $40 \times \$12$

3b.  $50 \times \$460$

- 4 **Multiply** numbers with decimals.

Find the product.  $8 \times \$9.42 = \$75.36$

4a.  $7 \times \$8.15$

4b.  $6.5 \times \$11.46$

### MATH TIP

Write whole dollar amounts in your answers as whole numbers without decimals. For example, write \$525, not \$525.00.

## ■ Gross Pay for Hourly-Rate Employees

Most people earn money by working for others. Those who work for others are called **employees**. The person or company an employee works for is called an **employer**.

An employee who is paid by the hour works for an **hourly rate**, which is a certain amount for each hour worked. The total amount of money that an employee is paid is called **gross pay** or *gross wages*. Gross pay may also be called total earnings or total pay.

The gross pay earned by employees who are paid by the hour is found by multiplying the pay per hour by the hours worked.

$$\text{Hourly Rate} \times \text{Number of Hours Worked} = \text{Gross Pay}$$

### EXAMPLE 1

Mark Willow works as a customer service representative and is paid \$9.10 per hour. He worked 38 hours last week. Find his gross pay.

#### SOLUTION

Multiply the hours worked by the hourly rate.

$$38 \times \$9.10 = \$345.80$$

Mark's gross pay for last week was \$345.80.

### CALCULATOR TIP

When you use a calculator, the decimal point will be placed correctly automatically. This feature is called *floating decimal point*. Your calculator will show 345.8. To write the answer, add the 0 and a dollar sign.

### ■ CHECK YOUR UNDERSTANDING

- A. Kenny Walker works as a shopping mall security guard and is paid \$7.50 an hour. Find his gross pay when he works 46 hours a week.
- B. Cassie Boland earns \$16.25 an hour. What gross wages did she earn last week by working 25 hours?

### EXAMPLE 2

Sharon Medal is paid \$7 an hour. Last week Sharon worked 8 hours a day for 5 days. Find her gross pay for last week.

#### SOLUTION

$$5 \times 8 = 40 \quad \text{hours worked in last week}$$

$$40 \times \$7 = \$280 \quad \text{gross pay for last week}$$

### ■ CHECK YOUR UNDERSTANDING

- C. Rosa Mendez works 8 hours Monday through Friday as a legal assistant. Her hourly wage is \$18.75. Find how many hours she worked in one week and her gross pay for that week.
- D. Vincent O'Malley worked the following schedule one week: Monday, 8 hours; Tuesday, 6 hours; Wednesday, 7 hours; Thursday, 6 hours; Friday, 5 hours. He was paid \$9 an hour. How many hours did Vincent work that week and what was his gross pay?



## ■ Gross Pay for Salaried Employees

Some employees are paid a **salary**, which is a fixed amount of money for each time period worked, such as a day, week, month, or year. They are referred to as *salaried employees*. To find their gross pay, multiply their pay for a time period by the number of time periods worked.

$$\text{Pay per Time Period} \times \text{Number of Time Periods Worked} = \text{Gross Pay}$$

### EXAMPLE 3

Albert Meyer is paid a salary of \$465 a week. How much gross pay does Albert receive for 4 weeks of work?

#### SOLUTION

$$\begin{array}{r} \$465 \\ \times 4 \\ \hline \$1,860 \end{array}$$

pay for 1 week  
weeks worked  
gross pay for 4 weeks

### MATH TIP

1 year = 12 months

1 year = 52 weeks

1 year = 365 days

### ■ CHECK YOUR UNDERSTANDING

- E. Tek Research pays its office manager a weekly salary of \$680. What gross pay will the office manager receive every 2 weeks?
- F. Tom works as a dispatcher and is paid a weekly salary of \$540. What gross pay will Tom earn for one year of work?

## Wrap Up

Look back at the Startup question. Sarah's weekly gross pay is \$810. A month has anywhere from 4 weeks to about  $4\frac{1}{2}$  weeks. So, Sarah's monthly pay will be between \$3,240 and \$3,645. It is not possible for her to earn \$3,750 a month working 54 hours a week.

## WORKPLACE WINDOW

Interview two people you know who work full time. Choose one person who is paid a salary, and another who is paid by the hour. Find out each person's job title and list his or her job responsibilities.

Ask each person if they like the method by which they are paid. For example, ask the salaried employee whether he or she would rather be paid hourly. Ask the hourly employee whether he or she would prefer to be paid a salary. Be sure to ask them for their reasons.

As a class, make a complete list of all job titles, job responsibilities, and methods of payment. Discuss reasons why salaried and hourly paid employees liked and disliked their methods of payment. Look for general trends among the types of jobs that are salaried and the types that are paid hourly.

## EXERCISES

#### Find each sum.

1.  $8 + 7 + 6.5 + 7 + 8$

2.  $7 + 6.5 + 7.5 + 8 + 6$

3.  $\$1,500 + \$723$

4.  $\$680 + \$72$

#### Find each product.

5.  $38 \times \$12$

6.  $40 \times \$9.80$

7.  $25 \times \$412$

8.  $7.5 \times \$8.10$

9.  $7.75 \times \$418$

10.  $10 \times \$1,200$

11. Francesco Jardin earns \$7 an hour at his part-time job. Last week he worked 16 hours. What was his gross pay for the week?
12. Shannon Burke is a substitute teacher. On the days she works she is paid \$85 a day. What is Shannon's pay for 3 days of work?
13. Caroline Gracely works 8 hours a day Monday through Friday as an engineer. Find her gross pay for one week. She is paid \$20.15 an hour.
14. Tom Page earns \$368 a week. Tom is paid every two weeks. What gross pay does he receive each payday?
15. Jacob Tenoever works 10 hours a day Monday through Thursday as a factory worker. Find his gross pay for one week. He is paid \$11.40 an hour.
16. An employee earns \$2,300 each pay period. He is paid on the first and fifteenth of each month. How much does he earn in one year?
17. Eldon Cavanaugh is paid a weekly salary of \$562. How much would Eldon earn in 4 weeks of work?
18. Use Eldon's information from Exercise 17 to find how much would he earn in one year, assuming that he works 50 weeks and is paid for 2 weeks of vacation?
19. Edmund Jasik earned \$274.50 last week at his regular job. Last week he also worked 11 hours at his part-time job that pays him \$8.25 an hour. What total pay did he earn from both jobs last week?



The chart below shows the hourly pay and hours worked for Trilton Company's four employees. Copy and complete the chart.

	Employee	Hourly Pay	Hours Worked	Gross Pay
20.	Rick Wilson	\$9.25	40	
21.	Art Dillart	\$9.45	32	
22.	Letitia Reed	\$9.75	42	
23.	Alice Boehm	\$9.50	36	
24.	Total			

25. **CRITICAL THINKING** Look at the Start Up problem for this lesson. Assume that Sarah feels that she must have a monthly gross pay of at least \$3,750 to meet her expenses. What advice would you give to Sarah about the choices she might need to make?

## MIXED REVIEW

26.  $\$680 + \$302$
27.  $52 \times \$826$
28.  $40 \times \$7.80$
29.  $7.5 \times \$9.42$
30. Marion Polk worked 9 days in two weeks. He worked 8 hours each day and was paid \$7.10 an hour. What gross pay did he earn for the two weeks?

# 1.2

## Average Pay

### GOALS

- Calculate simple averages
- Calculate averages from grouped data
- Find the unknown item in a set of data

### Start Up

A six-figure income is a total yearly earnings amount that most people will never receive. A part-time grocery clerk once joked that her annual pay of \$8,000 showed she had a six-figure income of \$8,000—if you count the cents. In reality, a six-figure income means that a person has annual earnings from \$100,000 to \$999,999. If one person earning \$100,000 and another earning \$999,999 annually were paid each week, what would be their gross pay each week, rounded to the nearest dollar?

### Math Skill Builder

Review these math skills and solve the exercises that follow.

- 1 **Divide** money amounts.

Find the quotient.  $\$95 \div 5 = \$19$

1a.  $\$450 \div 5$

1b.  $\$18,000 \div 12$

- 2 **Round** to the nearest cent.

Round this amount to the nearest cent.  $\$9.287 = \$9.29$

2a.  $\$8.765$

2b.  $\$9.996$

2c.  $\$7.097$

- 3 **Multiply** money amounts by whole numbers.

Find the product.  $8 @ \$8.25 = \$66$

3a.  $7 @ \$7.25$

3b.  $4 \times \$178$

3c.  $4 @ \$76$

### MATH TIP

The symbol @ means at. It means the same as multiply.

### Simple Averages

An **average** is a single number used to represent a group of numbers. The most commonly used average is the simple average.

A *simple average* is found by adding several numbers and dividing the sum by the number of items added. Another name for a simple average is the *mean*.

## EXAMPLE 1

Tricia Willard earned these amounts for the 5 days she worked last week: Monday, \$82; Tuesday, \$91; Wednesday, \$96; Thursday, \$80; Friday, \$86. What was her average pay for the 5 days?

### SOLUTION

Add daily amounts to find total pay.

$$\$82 + \$91 + \$96 + \$80 + \$86 = \$435 \quad \text{total pay}$$

Divide the sum by the number of days to find the average pay per day.

$$\$435 \div 5 = \$87 \quad \text{average pay per day}$$

## ■ CHECK YOUR UNDERSTANDING

- A. Monica Wilkes earned these amounts last week at her part-time job: Friday, \$18; Saturday, \$58; Sunday, \$32. What was her average daily pay for the 3 days she worked?
- B. A clothing designer earned these amounts in four consecutive months: \$2,400, \$3,200, \$1,500, \$1,700. What average monthly earnings did the designer have for these 4 months?



## EXAMPLE 2

Valeria Mishkov earns \$18,000 per year as assistant manager at a local store. Find her average pay per hour (to the nearest cent) if she works 37.5 hours for 50 weeks per year and gets 2 weeks paid vacation.

### SOLUTION

Find total weeks for which pay is received.

$$50 + 2 = 52 \text{ weeks}$$

Find total hours for which she is paid in 1 year.

$$37.5 \times 52 = 1,950 \quad \text{total hours}$$

Divide the total earnings by the number of hours. Round the final answer to the nearest cent.

$$\$18,000 \div 1,950 = \$9.2308, \text{ or } \$9.23 \quad \text{average pay per hour}$$

### MATH TIP

In solving problems in this book, round to the nearest cent all answers involving money amounts unless you are directed otherwise.

## ■ CHECK YOUR UNDERSTANDING

- C. Last month Antoine Beal earned \$264 by working 38 hours at his part-time job. What average hourly pay did he earn last month, to the nearest cent?
- D. LaKeisha Jones earned \$35,800 in the first year of her new job. After receiving a promotion she earned \$47,000 in the second year. What were her average earnings for the two years?



## ■ Averages in Grouped Data

A number or rate can occur more than once in a set of data. When that happens, you can find the sum quickly by grouping the common numbers.

### EXAMPLE 3

Brandon Chin sell t-shirts at the beach. During the first month of the season, he earned \$600. In each of the next three months he earned \$1,050 per month. In the last month of the season, Brandon earned \$180. What were his average earnings per month for those five months?

#### SOLUTION

Find his total earnings for months worked.

$$1 \text{ month @ } \$600 = \$600$$

$$3 \text{ months @ } \$1,050 = \$3,150$$

$$1 \text{ month @ } \$180 = \$180$$

$$5 \text{ total months} = \$3,930 \quad \text{total earnings}$$

Divide the total earnings by the months worked.

$$\$3,930 \div 5 = \$786 \quad \text{average monthly earnings}$$

#### CALCULATOR TIP

To use grouped data with a calculator, press the M+ key (instead of the Equal or Enter key) to complete the multiplication for each line and store the product. Press MR/C to recall the total. Then divide by the number of items.

### ■ CHECK YOUR UNDERSTANDING

- E. The Runwell Company has 8 employees. Five of the employees earn \$12 an hour, two earn \$9 an hour, and 1 earns \$11 an hour. What is the average amount per hour that the employees are paid?
- F. Rosalind Jeszko repairs vending machines. She earned these amounts in the first 4 weeks of the year: Week 1, \$280; Week 2, \$315; Week 3, \$424; Week 4, \$265. What were her average earnings for the 4 weeks, rounded to the nearest dollar?

## ■ Unknown Items in a Set of Data

If one item in a group or set of data is unknown, you may have to find it. Averages are used often in finding the value of the unknown item.

### EXAMPLE 4

The weekly pay of four picture frame assemblers in a company averages \$433 per employee. The weekly pay amounts of three of the four employees are \$400, \$410, and \$460. What is the weekly pay of the fourth employee?

#### SOLUTION

Multiply the average employee pay to find the total pay of 4 employees.

$$4 \times \$433 = \$1,732 \quad \text{total pay}$$

Add to find the total pay of the known employees.

$$\$400 + \$410 + \$460 = \$1,270 \quad \text{total pay of 3 employees}$$

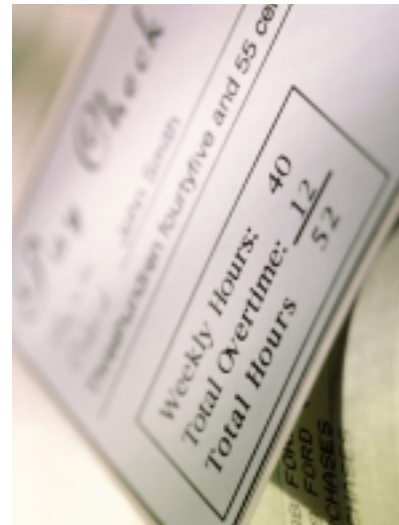
Subtract the totals to find the missing weekly pay item.

$$\$1,732 - \$1,270 = \$462 \quad \text{weekly pay of fourth employee}$$

### ■ CHECK YOUR UNDERSTANDING

G. Your daily pay for the first 4 days of the week was \$68, \$80, \$75, and \$79. How much do you have to earn on the fifth day to average \$77 a day in earnings for the 5-day week?

H. Hank Borden was paid \$420 for 5 days work. For 4 of those days, his average pay was \$86. Find his pay for the fifth day.



## Wrap Up

The two ends of the six-figure income range must be divided by 52 weeks to calculate the average weekly pay. A person earning \$100,000 a year would have weekly earnings of \$1,923. The person earning \$999,999 would earn \$19,231 weekly. Because the weekly pay figures are rounded, the answers are approximate.

## TEAM MEETING

A company can have as few as one employee to as many as tens of thousands of employees. This class activity will simulate a company's weekly payroll for hourly-rate employees. You need two boxes. Mark one Dollars and the other Cents. Place in the Dollar box slips of paper marked from \$5 to \$11. In the Cents box place slips marked from \$0.55 to \$0.95 in multiples of 0.05. Each student randomly chooses an hourly pay rate by drawing one slip from each box. Then, complete these steps.

1. List all hourly rates. Record the number of students at each rate.
2. Find the average hourly pay rate for all class members.
3. Calculate the total weekly gross pay for all students for a 40-hour week using the hourly rate drawn.
4. Find the average weekly gross pay of the class.

## EXERCISES

**Find the quotient or product.**

1.  $\$4,500 \div 12$

2.  $\$620 \div 40$

3.  $12 \times \$1,578$

4.  $4 @ \$12.75$

**Round to the nearest cent.**

5. \$406.439

6. \$10.407

7. Ben's earnings for work he did from Monday through Saturday were: \$78, \$94, \$115, \$108, \$67, \$78. What was his average daily pay for the days he worked?

**Two years ago Randi earned \$18,400. Last year she earned \$19,700. Suppose she earns \$21,600 this year.**

8. What total amount will Randi have earned for the three years?
9. What will be her average earnings per year?
10. Four employees are paid a monthly salary as follows: Wilma, \$1,820; Mavis, \$1,615; Martha, \$1,977; Tom, \$1,560. What average salary per month are these employees paid?
11. Emma has been offered a job that pays \$38,950 for working a 52-week year training software users. What average amount does the job pay per month? per week?

**Rashad earned \$662 by working five days a week at his full-time job. He earned \$118 for 12 hours of work at his part-time job.**

12. What average pay per day did he earn from full-time work?
13. What average amount per hour did he earn from part-time work?

**Three weeks ago James worked 46 hours and earned \$414. Two weeks ago he earned \$333 by working 37 hours. Last week he worked 42 hours for \$378.**

14. For the three weeks how many hours did James work?
15. What were his total earnings?
16. What were his average hourly earnings?
17. What were his average weekly earnings?

18. At her job of grooming horses, Polly Yaskovich worked 8 hours a day on Monday and Tuesday and earned \$69 each day. On Wednesday, she earned \$82. On Thursday and Friday, she earned \$78 a day. What was Polly's average daily pay for the 5 days she worked?

19. The Willis Avenue Door Company gave its employees bonuses. Six employees received a bonus of \$940 each; 4 employees received a bonus of \$820 each; 5 employees were paid a bonus of \$1,150 each. What was the average bonus paid to these employees?

20. The owner of Mid-Town Rapid Delivery plans to spend no more than \$980 a day for employees' wages. The owner now has 8 employees who earn an average of \$108 a day. Another employee must be hired. What is the most the new employee can be paid without spending more money than planned?





Yi Chin was offered a new job. For the first 3 months she works, she will be paid a monthly salary of \$1,600. Her monthly pay for the next 3 months will be \$1,760. For the next 6 months after that, Yi's monthly salary will be \$1,936.

21. How much will Yi earn during a full year?
22. What average pay per month will she receive if she works a full year?
23. Beatrix Thompson owns a craft shop and plans to sell 260 ceramic vases this year. She earns \$25 for every vase sold. For the first 8 months of this year, she sold an average of 16 vases a month and had total earnings of \$3,200. How many vases must she sell, on average, in each of the remaining 4 months to reach her goal?
24. **STRETCHING YOUR SKILLS** Marsha's scores on seven tests were: 82, 78, 77, 93, 85, 91, and 86. What was her average score on the tests, rounded to the nearest whole number?
25. **STRETCHING YOUR SKILLS** The owner of a small business bought 5 cases of copier paper for \$14 each, 8 cases for \$13.50, and 11 cases for \$12.75. What average price did the owner pay for each case, to the nearest cent?
26. **CRITICAL THINKING** The owner of a business has two skilled employees who each earn \$160 a day and 12 unskilled employees who each earn \$56 a day. Find the average daily pay for the 14 employees. Does the average show what the "average" worker is paid?
27. **DECISION MAKING** The daily cost of public transportation to get you to and from your current job is \$5. You regularly work 8 hours a day Monday through Friday and 4 hours on Saturday. You have been offered a new job close to home where you could walk to and from work each day. The new job pays \$0.75 less an hour than your current job. You will work an average of 44 hours a week. Will you make or lose money by taking the new job?

## MIXED REVIEW

28. Find the quotient:  $\$31,920 \div 12$
29. Find the product:  $\$235 \times 4$
30. What is \$12.655 rounded to the nearest cent?
31. Carmella Petrocelli earns a weekly salary \$1,352 as a web site designer. If she works at this pay rate for a year, what will be her total annual earnings?
32. Sol Levin sold 22 pairs of shoes each day, Monday through Wednesday, 28 pairs on Thursday, and 31 on Friday. How many shoes must he sell on Saturday to average 29 pairs sold for the 6 days he worked during the week?

## 1.3

# Regular and Overtime Pay

## GOALS

- Compute overtime pay rates
- Calculate regular and overtime pay

### Start Up

Victor and George are employed by the same company. Victor worked 40 regular hours last week and earned \$480. In the same week George worked 38 total hours, including 4 overtime hours. He also earned \$480. How is this possible?

### Math Skill Builder

Review these math skills and solve the exercises that follow.

- 1 **Rewrite** fractions and mixed numbers as their decimal equivalents.

Rewrite as a decimal.  $1\frac{1}{2} = 1.5$

1a.  $\frac{3}{4}$

1b.  $\frac{1}{2}$

1c.  $6\frac{3}{4}$

1d.  $48\frac{3}{4}$

- 2 **Add** decimals.

Add.  $6.25 + 4.75 + 7.5 = 18.5$

2a.  $5.5 + 7.25 + 8 + 7 + 6.75$

2b.  $8.4 + 9.1 + 7.7$

- 3 **Multiply** decimals. Remember to round to the nearest cent.

Multiply.  $\$18.30 \times 6.5 = \$118.95$

3a.  $\$12.80 \times 1.5$

3b.  $\$11.63 \times 40.5$

3c.  $\$9.87 \times 45.7$

- 4 **Round** to the nearest cent.

Round.  $\$1,874.898 = \$1,874.90$

4a.  $\$24.373$

4b.  $\$99.995$

4c.  $\$537.307$

### Recording Hours Worked

Many companies keep an exact record of the number of hours their employees work. They record the times people arrive at work, take breaks, and leave for the day.

Most larger companies electronically record time worked. As employees arrive at work or leave, they pass a *magnetic stripe card* through a reader. Time is recorded in a computer connected to the reader.



Other companies use a *time card* to record the work time of employees. As they arrive or leave, employees manually insert the time card into a slot on a time clock where the current time is printed. Smaller companies simply write the times employees work on a payroll form called a *time sheet*.

Computers are almost always used to figure the total time worked for a pay period regardless of the method used to record time worked. Computers also apply any penalties for employees who are late to work or leave early.

**TIME BY QUARTER HOURS** Some companies record time worked in 15-minute segments so that any part of an hour would show as  $\frac{1}{4}$ ,  $\frac{1}{2}$ , or  $\frac{3}{4}$  hours. In decimal form the part of an hour would be shown as 0.25, 0.5, or 0.75 hours. An employee that worked seven and one-half hours in a day would have their work time recorded as  $7\frac{1}{2}$ , or 7.5, hours.

The time worked for a day or week would also include any penalties for being late. For example, a company that records time in quarter hours may penalize a worker 15 minutes for arriving more than 3 minutes late to work or leaving more than 3 minutes before the end of scheduled work time. Similar penalties also apply to scheduled breaks or lunch.

**TIME BY TENTHS OF HOURS** Most companies record work time in tenths of an hour. Since an hour has 60 minutes, one tenth of an hour is 6 minutes. Parts of an hour would be shown as: 6 minutes = 0.1 hour; 12 minutes = 0.2 hour; 18 minutes = 0.3 hour; and so on. Penalties in 6-minute segments are deducted from time worked for employees who arrive late or leave early throughout the day.



## ■ Overtime and Overtime Pay Rates

Companies record regular hours of work and **overtime**, which is time worked beyond the regular working day or week. Daily overtime is based on a regular working day, such as an 8-hour day. So, an employee who works 10 hours in one day will be paid for 8 hours regular time and 2 hours overtime.

If the regular working week is 40 hours, then an employee who works 45 hours in a week is paid for 40 regular hours and 5 overtime hours.

**OVERTIME RATES** Overtime pay is often figured at one and a half times ( $\times 1.5$ ) the regular-time rate and is called **time-and-a-half pay**. Sometimes **double-time pay** is given for work over a certain number of hours, or for work on weekends and holidays. Double-time pay is twice ( $\times 2$ ) the regular-time pay rate.

To find a time-and-a-half pay rate, multiply the regular pay rate by 1.5.

**$1.5 \times \text{Regular Pay Rate} = \text{Time-and-a-Half Rate (Do NOT round.)}$**

To find the double-time pay rate, multiply the regular rate by 2.

**$2 \times \text{Regular Pay Rate} = \text{Double-Time Rate}$**

## EXAMPLE 1

Paul Mears' regular pay is \$10.73 an hour. His employer pays overtime at 1.5 of the regular rate and double time at twice the regular rate of pay. What are Paul's time-and-a-half and double-time pay rates?

### SOLUTION

$$1.5 \times \$10.73 = \$16.095 \quad \text{time-and-a-half rate}$$

$$2 \times \$10.73 = \$21.46 \quad \text{double-time rate}$$

## ■ CHECK YOUR UNDERSTANDING

A. Find time-and-a-half and double-time rates for these regular-time pay rates.

1) \$7.51

2) \$8.76

3) \$13.67

B. Emilio's regular-time pay rate is \$11.25 per hour. What time-and-a-half and double-time rates would he earn for overtime work?

## ■ Regular and Overtime Wages

To find gross wages for an employee who has worked both regular time and overtime, use these five steps.

Step 1: Find the number of regular-time and overtime hours worked.

Step 2: Find the overtime pay rate or rates.

Step 3: Find the regular-time pay by multiplying the regular-time hourly rate by the number of regular-time hours worked.

Step 4: Find the overtime pay by multiplying the overtime hourly rate by the number of overtime hours worked. Match time-and-a-half overtime hours and rate; match double-time overtime hours and rate.

Step 5: Add the regular-time pay and the overtime pay.

## EXAMPLE 2

Stanley Bartlett's time is recorded in quarter hours. He worked these hours last week: Monday,  $7\frac{1}{4}$ ; Tuesday, 10; Wednesday,  $9\frac{1}{2}$ ; Thursday, 8; Friday, 9. Stanley is paid based on an 8-hour day with time-and-a-half for daily overtime. If Stanley's regular-time pay rate is \$9.50 per hour, what gross wages did he earn last week?

### SOLUTION

$$\text{Step 1: } 7.25 + 8 + 8 + 8 + 8 = 39.25 \quad \text{regular-time hours}$$

$$2 + 1.5 + 1 = 4.5 \quad \text{time-and-a-half overtime hours}$$

$$\text{Step 2: } 1.5 \times \$9.50 = \$14.25 \quad \text{time-and-half rate}$$

$$\text{Step 3: } 39.25 \times \$9.50 = \$372.88 \quad \text{regular-time pay}$$

$$\text{Step 4: } 4.5 \times \$14.25 = \$64.125 \approx \$64.13 \quad \text{time-and-a-half pay}$$

$$\text{Step 5: } \$372.88 + \$64.13 = \$437.01 \quad \text{gross wages}$$

### CALCULATOR TIP

It is often easier to work with decimals than fractions. To change a fraction such as  $\frac{3}{4}$  to a decimal, use  $3 \div 4 = 0.75$

### EXAMPLE 3

Olivia Ricardo works on a 40-hour week basis, and her work time is recorded in tenths of hours. She is paid time-and-a-half for all hours worked over 40 hours in a week. Olivia's regular-time pay is \$12.87 an hour. She worked these hours in a week: Monday, 8.4, Tuesday, 7.8, Wednesday, 8.0, Thursday, 9.2; Friday, 8.5. What gross wages did Olivia earn last week?

#### SOLUTION

Step 1:  $8.4 + 7.8 + 8.0 + 9.2 + 8.5 = 41.9$  total hours worked

$41.9 - 40.0 = 1.9$  overtime hours is hours over 40

Step 2:  $1.5 \times \$12.87 = \$19.305$  time-and-a-half rate

Step 3:  $40 \times \$12.87 = \$514.80$  regular-time pay

Step 4:  $1.9 \times \$19.305 = \$36.679$ , or \$36.68 overtime pay

Step 5:  $\$514.80 + \$36.68 = \$551.48$  gross wages

### ■ CHECK YOUR UNDERSTANDING

C. Xavier Centor works on an 8-hour day. He is paid \$13.69 an hour for regular-time work and time-and-a-half for any hours over 8 hours a day. Xavier worked these hours last week: Monday,  $9\frac{3}{4}$ ; Tuesday, 8; Wednesday, 6; Thursday,  $8\frac{1}{2}$ ; Friday, 8. Complete all five steps to find Xavier's gross wages for last week.

D. Diedra McKenney works on a 40-hour week basis with time-and-a-half paid for overtime work. Her regular-time hourly rate is \$17.50. Last week she worked 45.3 hours from Monday through Thursday and 8.1 hours on Friday. Complete all five steps to find Diedra's gross wages for last week

## Wrap Up

Companies pay more for overtime work than for regular-time work. Victor earned his pay of \$480 by working 40 hours at \$12 an hour. George earned only \$408 ( $34 \times \$12$ ) from regular-time work but made up the difference by working 4 hours overtime at an overtime pay rate of \$18 an hour.

## TEAM MEETING

Imagine you are responsible for supervising a small group of workers and have been assigned to write guidelines for them. The company you work for expects employees to be on time for work and not leave early. The penalty for employees who break this work rule is a loss of pay.

What rules would you have about paying employees who are ill or need time off from work to take care of personal business? Will the rules be different for new employees or the same as those rules for people who have been with the company longer? Be fair to your employees, to yourself, and to the company when writing the guidelines. As a class discuss everyone's guidelines. Make a list of the rules the class generally agrees on.



## EXERCISES

### Add decimals.

1.  $8.5 + 9.75$

2.  $6.75 + 6.75 + 8$

### Rewrite as decimals.

3.  $\frac{1}{2}$

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

5.  $43\frac{1}{2}$

6.  $40\frac{1}{4}$

### Multiply decimals.

7.  $1.5 \times 11.63$

8.  $1.5 \times 9.87$

### Round to nearest cent.

9. \$78.438

10. \$298.987

11. \$419.097

**Jaci Welk is paid \$11.95 an hour with time-and-a-half pay for all hours she works over 40 hours a week. Last week she worked  $45\frac{1}{2}$  hours.**

12. How many overtime hours did Jaci work?

13. What was her overtime rate?

14. What was her overtime pay?

**Steve Gaimes is paid overtime for all time worked past 40 hours in a week. His regular-time pay rate is \$12 an hour, and his overtime pay rate is \$18 an hour. Last week Steve worked 47.3 hours.**

15. How many regular-time hours did Steve work last week?

16. How many overtime hours did he work last week?

17. What was Steve's regular-time pay last week?

18. What was his overtime pay last week?

19. What was Steve's gross or total pay last week?

20. Alberta Doan worked 6 hours at time-and-a-half pay and  $3\frac{1}{4}$  hours at double-time pay. Her regular pay rate was \$9.72 an hour. What was Alberta's total overtime pay for the week?

**Ike Phillips worked 6.7 hours at time-and-a-half pay and 3.4 hours at double-time pay last week. His regular earnings for the week were \$454.80 figured on a regular pay rate of \$11.37 an hour.**

21. What were Ike's time-and-a-half and double-time pay rates?

22. What amounts did he earn for time-and-a-half and double-time work?

23. What was Ike's total gross pay for the week?



24. **CRITICAL THINKING** At the end of an interview you are offered a job. You would start at \$7.50 an hour and work an average of 45 hours a week. At the end of six months with a positive evaluation, your hourly pay would increase to \$8. The job pays overtime at a time-and-a-half rate, based on a  $37\frac{1}{2}$  hour regular work week. What total earnings could you expect to make by working a full year?
25. **CRITICAL THINKING** Why do jobs, or even the same type of job at different companies, have different rates of pay?
26. **DECISION MAKING** You are offered a job by two companies. Both companies pay overtime based on a 40-hour week. The Aztec Company's regular hourly rate is \$8.60 and workers are penalized 15 minutes if they arrive at work more than 3 minutes late or leave more than 3 minutes early. The Wolfson Company pays a regular hourly rate of \$8.35 and the 15-minute pay deduction is based on employees arriving no more than 6 minutes late or leaving no more than 6 minutes early. Use only the information provided to decide which company's offer will you accept and why?

## MIXED REVIEW

27.  $\$24 \times \frac{3}{4}$                       28.  $\frac{2}{5} + \frac{2}{3}$   
29.  $115\% \times \$30$              30.  $\$34,000 \div \$10,000$   
31. What is 20% more than 50?      32. What is 1% of \$2,593?

**Solve each proportion.**

33.  $\frac{1}{2} = \frac{?}{30}$                       34.  $\frac{2}{?} = \frac{14}{49}$                       35.  $\frac{3}{5} = \frac{45}{?}$

**Tina Colbert's annual pay is \$34,320. What is her average gross pay?**

36. per month?                      37. per week?                      38. per day

**Last week, Greg Derkaz worked 4 hours a day Monday through Friday at his after-school job. He is paid \$8.20 an hour.**

39. How many hours did Greg work last week?
40. What was his gross pay for the week?
41. Sallie Woo worked these hours last week: Monday, 10; Tuesday,  $8\frac{1}{4}$ ; Wednesday,  $9\frac{1}{2}$ ; Thursday, 6; Friday, 8; Saturday, 5. Sallie is paid \$11.40 per hour for regular hours, time and a half for overtime during the week, and double time for weekend hours. If Sallie works on an 8-hour day basis, what was her pay for the week?
42. The Caloto.com Company has 5 employees whose average weekly pay is \$890. The weekly pay amounts of 4 of the employees are: \$760, \$910, \$825, and \$1,200. What is the weekly pay of the fifth employee?
43. Mary Lynn Bower worked 8 hours a day, Monday through Wednesday, 8.8 hours on Thursday, and 8.7 hours on Friday. She works an 8-hour day at a regular-time rate of \$16.48 and overtime at time-and-a-half. What was her gross pay for the week?
44. Ida Taylor is paid a monthly salary of \$2,800. What will be her earnings for 1 year at this pay rate?

# 1.4

# Commission

## Goals

- Calculate straight commission earnings
- Calculate commission earnings based on quota
- Calculate graduated commission earnings
- Find the rate of commission

## Start Up

Two sales jobs are advertised in the newspaper. The first job pays a commission of 3.5% on all sales, and sales usually average \$52,000 a month. The second job pays a commission of 4% on sales up to \$5,000 and 12% on sales over \$5,000, and sales usually average \$25,000 a month. Based on the usual monthly sales average, which job pays more?

## Math Skill Builder

Review these math skills and solve the exercises that follow

- 1 Rewrite a percent as a decimal.**  
Rewrite this percent.  $50\% = 0.5$ 
  - 1a. 12%
  - 1b. 18.6%
  - 1c. 2.5%
- 2 Find a percent of a number.**  
Find the percent.  $1\% \text{ of } \$1,956 = 0.01 \times \$1,956 = \$19.56$ 
  - 2a. 14% of \$500
  - 2b. 3.5% of \$1,200
- 3 Rewrite a decimal as a percent.**  
Rewrite this decimal.  $0.25 = 25\%$ 
  - 3a. 0.08
  - 3b. 0.75
  - 3c. 0.01
  - 3d. 0.1825
- 4 Find what percent one number is of another number.**  
Find the percent.  $\$10 \div \$80 = 0.125$  or 12.5%
  - 4a.  $\$15 \div \$75$
  - 4b.  $\$4,800 \div \$32,000$



## ■ Straight Commission

Some salespeople earn a commission instead of a fixed salary or hourly pay. A **commission** may be an amount for each item sold, or it may be a percent of the dollar value of sales. A higher commission may be earned for goods that are harder to sell than for goods that are easy to sell. Both a salary and a commission may be earned.

Salespeople whose earnings come only from commission work on a **straight commission** basis. When the rate of commission is an amount for each item sold, multiply the number of items by the rate to find the commission.

$$\text{Quantity Sold} \times \text{Rate of Commission} = \text{Commission}$$

### EXAMPLE 1

Maxwell Lytle sells decorative notepads and is paid a straight commission of \$0.80 on each notepad he sells. During December, he sold 750 notepads. Find his commission.

#### SOLUTION

$$750 \times \$0.80 = \$600 \quad \text{commission}$$

### ■ CHECK YOUR UNDERSTANDING

- A. Lorraine Wilk is paid a commission of \$1.30 for each hand-painted tile she sells. What commission did she earn by selling 74 tiles last week?
- B. Leo Margolis receives a \$0.075 commission for each newspaper he sells at his newsstand. What commission would he earn by selling 1,200 newspapers?

When the rate of commission is a percent, multiply the amount of the sales by the rate to find the commission.

$$\text{Sales} \times \text{Rate of Commission} = \text{Commission}$$



### EXAMPLE 2

Huey Gaines is paid a straight commission of 6% on his sales. During February, his sales were \$38,000. What was his commission?

#### SOLUTION

$$\$38,000 \times 0.06 = \$2,280 \quad \text{commission}$$

### ■ CHECK YOUR UNDERSTANDING

- C. Melvin's sales last month of a new tile cleaner were \$9,500. If he receives a commission rate of 15% of all sales, what commission did he earn?
- D. Jacqueline earns 15% commission on sales. Her sales for three months were: \$2,870, \$3,150, and \$3,940. What was her total commission for the three months?

## ■ Commission Based on Quota

Some salespersons may be paid a commission that is a percent of their sales above a certain amount. This fixed amount is called a **quota**. Salespersons may also be paid a salary in addition to commission.

### EXAMPLE 3

Leona Bahr is paid a commission of 12% on all sales above \$7,000 for the week. She is also paid a weekly salary of \$380. What are her total earnings for a week in which her sales were \$9,800?

#### SOLUTION

Sales	\$9,800	Salary	\$380
Quota	<u>-7,000</u>	Commission	<u>+336</u>
Sales over Quota	\$2,800	Total Earnings	\$716

Commission:  $12\%$  of  $\$2,800 = \$336$

Leona's total earnings were \$716

### ■ CHECK YOUR UNDERSTANDING

- E. Colby Richards is paid a salary of \$125 a week and a 3% commission on all sales he makes above \$2,000 for the week. What total earnings did he have for a week in which his sales were \$2,890?
- F. Lula Krobo is paid a 7% commission on all sales over \$15,000 in a month and a monthly salary of \$2,300. Her last month's sales were \$29,700. What were Lula's total earnings for the month?

## ■ Graduated Commission

Some salespersons are paid a **graduated commission**. This means their rate of commission increases as their sales increase. For example, the rate may be 3% on the first \$12,000 of sales; 4% on the next \$6,000; and 5% on sales over \$18,000. Graduated commissions may also be based on the number of units sold.

### EXAMPLE 4

Lamont Cotton is paid 4% commission on the first \$10,000 of monthly sales and 10% on all sales over \$10,000. Last month his sales were \$38,000. What was his commission?

#### SOLUTION

Commission on first \$10,000:  $\$10,000 \times 0.04 = \$400$

Sales over \$10,000:  $\$38,000 - \$10,000 = \$28,000$

Commission on sales over \$10,000:  $\$28,000 \times 0.10 = \$2,800$

Total commission:  $\$400 + \$2,800 = \$3,200$

## ■ CHECK YOUR UNDERSTANDING

- G. Morgan Lee is paid a commission of 3% on the first \$100,000 of monthly sales and 5% on any sales above that amount. What commission did he earn if his sales for a month were \$120,000?
- H. Janice Corrudo is paid a commission of 15% of her yearly sales up to \$85,000 and 18% of any sales above \$85,000. Her total sales for last year were \$112,000. What total commission did she earn last year?

## ■ Rate of Commission on Sales

To find the rate of commission, divide the amount of commission paid on total sales by the total sales amount.

$$\text{Rate of Commission} = \text{Amount of Commission} \div \text{Sales}$$

### EXAMPLE 5

A salesperson sold a laptop computer and software for \$3,000 and received a \$120 commission. What percent commission did the salesperson receive?

#### SOLUTION

$$\$120 \div \$3,000 = 0.04 = 4\%$$

### CALCULATOR TIP

If your calculator has a % key, you can find the percent directly by following these steps: key 120, press  $\div$ , key 3000, press %. Be sure to add the percent symbol to your answer.

## ■ CHECK YOUR UNDERSTANDING

- I. Marc received a commission of \$448 for selling \$6,400 in goods in the past two weeks. What rate of commission did he earn?
- J. Nedra's sales last month were \$54,000 for which she received a commission of \$3,240. What rate of commission was Nedra paid?

## Wrap Up

The first sales job would pay monthly commission of \$1,820. The second job would pay commission of \$200 on the first \$5,000 of sales and \$2,400 on the \$20,000 of sales over \$5,000 in a month. Total monthly commission for the second job would be \$2,600. The second sales job pays more.

## COMMUNICATION

A company is considering changing the way in which it pays its sales staff. The company now pays a straight commission of 15% of all monthly sales. Sales now average \$24,000 a month per salesperson.

The company wants to switch to a plan that pays a monthly salary of \$1,500 and a 22% commission on all sales over \$15,000 a month. Team up with another student to figure what would be the increase or decrease in the annual wages of salespeople by using the new plan compared to the old plan. Write your answer in sentence form.

## EXERCISES

### Rewrite as a decimal.

1. 9.25%                      2. 16.2%                      3. 0.5%

### Find the amount.

4. 12% of \$800                      5. 7.5% of \$13,000                      6. 4.2% of \$569

### Find the percent.

7.  $\$1.26 \div \$7$                       8.  $\$1.20 \div \$8$                       9.  $\$90 \div \$2,000$

### Rewrite as a percent.

10. 0.08                      11. 0.11625                      12. 0.0025

13. Dan Pawlik is paid a straight commission of \$5.75 for each item he sells. Last month he sold 103 items. Find his estimated and exact commissions.
14. A student who sells subscriptions for a magazine that costs \$35 a year makes a commission of \$5.25 on each subscription. What percent commission does the student make?
15. Paul Batik earns a commission of 9% on sales. Last week he had sales of \$646.70, \$237.58, \$1,984.89, \$658.66, and \$953.73. Find his total commission to the nearest cent.
16. Jo Ann White is paid a salary of \$410 a week and a commission of 5.6% on all sales. Her sales last week were \$6,700. Find her total earnings for the week.
17. Sheldon Cole earns a salary of \$150 a week and a commission of 7% on all sales. If Cole's sales for one week were \$6,890, what were his total weekly earnings?
18. Roosevelt Quinn receives a weekly salary of \$600 plus  $\frac{1}{2}\%$  commission on all sales in excess of \$12,500 a week. Last week his sales were \$48,370. What were his total earnings for the week?
19. Alice Miller works for a paint manufacturer. She is paid 3% commission on her first \$20,000 of monthly sales and 8% commission on all sales over \$20,000. In March her sales were \$54,500; in April, her sales totaled \$47,300. What were the total commissions she earned for the 2 months?
20. Olivia Thoms sells surplus books to bookstores. She is paid a weekly commission of \$1.50 each on the first 50 books she sells, \$1.75 each on the next 100 books, and \$2 on any books she sells over 150. Last week she sold 225 books. What was her commission for the week?
21. Ludmilla Pavel is paid a commission on all sales over \$3,000 a week. Last week she earned a commission of \$420 on sales of \$16,000. What rate of commission was she paid to the nearest tenth percent?

Martin Ellis sells a line of cooking pots. He is paid a salary of \$1,150 a month plus a commission on all sales. Each month his employer pays \$120 of the cost of a health insurance plan. Last month his sales were \$35,000, and he earned a total salary and commission of \$3,250.

22. How much commission was Martin paid?
23. What rate of commission was he paid?
24. **CRITICAL THINKING** When a new inkjet printer model is introduced salespeople may be paid a larger commission by their store for each old printer model they sell. Why would the store's manager offer such an incentive to salespeople?
25. **CRITICAL THINKING** Write two paragraphs that explain the advantages and disadvantages of working on commission. The first paragraph should be from an employee's viewpoint, the second from the viewpoint of an employer.
26. **DECISION MAKING** You see ads on an Internet job listing service from two companies looking for salespeople. Both companies market a weight-loss system. The Slo-Loss Company pays a weekly salary of \$100 and a commission of 14.5% on sales. The Slim-Now Company pays a straight commission of 30% of sales. Both companies expect you to be able to have sales of \$1,000 in the first month and reach sales of \$5,000 at the end of six months. List the reasons in outline form why you want to get one job over the other.

## MIXED REVIEW

27. Find  $\frac{1}{4}\%$  of \$28,000
28.  $\$97,398 \times 1\%$
29. 60 is 15% of what number?
30. 20% more than \$18 is what amount?
31. \$250 decreased by what percent of itself is \$235?
32. Marc Bullard has two part-time jobs. At one job he worked 12 hours last week and was paid \$8.15 an hour. Marc worked 6.25 hours last week at his second job that pays \$7 an hour. What was his gross pay last week from both jobs?
33. Nola Potter earns a salary of \$1,200 a month and a commission of 7.5% on all sales over \$4,000. This month her sales were \$21,400. Find her total earnings for the month.
34. Carolyn Mills does maintenance work at a golf course. She earned these amounts last season: April, \$1,505; in each of the next four months, \$1,806; September, \$901. What were her average earnings per month for these 6 months?





# 1.5

## Other Wage Plans

### GOALS

- Calculate gross pay for piece-rate employees
- Calculate gross pay for per diem employees
- Calculate gross pay for tip employees

### Start Up

Employees, such as food service staff, whose pay varies widely, may need to estimate or project annual gross income based on current earnings. Assume that a waiter's monthly earnings from hourly wages and tips for the first quarter of the year are as follows: January, \$1,367; February, \$1,845; March, \$2,398. What is the projected annual gross income for the waiter based on the first quarter's earnings?



### Math Skill Builder

Review these math skills and solve the exercises that follow.

- 1 Add** whole numbers and money amounts.  
Find the sum.  $34 + 25 + 31 + 37 + 28 = 155$   
**1a.**  $78 + 92 + 101 + 86$       **1b.**  $\$135 + \$176 + \$157$
- 2 Multiply** money amounts by whole numbers.  
Find the product.  $347 \times \$0.81 = \$281.07$   
**2a.**  $181 \times \$1.24$       **2b.**  $5 \times \$98$
- 3 Multiply** money amounts by percents.  
Find the product.  $15\% \times \$54 = 0.15 \times \$54 = \$8.10$   
**3a.**  $20\% \times \$26$       **3b.** 5% of \$20.45      **3c.** 10% of \$60

### ■ Piece-Rate Employees

Employers use a variety of ways to pay their employees. Some employees are paid for each item or *piece* they produce. Their wages are paid on a **piece-rate** basis. To figure their gross pay, you must multiply their pay per piece by the number of pieces produced. If employees are paid only for usable pieces produced, they get no pay for the pieces that are rejected.

$$\text{Number of Pieces Produced} \times \text{Piece Rate} = \text{Gross Pay}$$

## EXAMPLE 1

Helen Burchett is paid \$1.30 for each usable picture frame she produces. What was Helen's gross pay for last week if she produced the following quantities of usable frames:

Monday	52
Tuesday	47
Wednesday	54
Thursday	50
Friday	45

### SOLUTION

$$52 + 47 + 54 + 50 + 45 = 248 \quad \text{usable frames produced}$$

$$248 \times \$1.30 = \$322.40 \quad \text{gross pay}$$

## ■ CHECK YOUR UNDERSTANDING

- A. Louise Schubert is paid \$18 for each computer she installs at customer offices. She installed these numbers of computers in 5 days last week: 7, 6, 9, 8, 5. What gross pay did Louise earn for the week?
- B. Trevor Sherr is paid \$1.20 for each hand-painted dish he produces. He is not paid for dishes that are not acceptable. On Monday, he painted 56 dishes; on Tuesday, he painted 44 dishes. For the two days 6 dishes contained slight errors and were unacceptable. What gross pay did Trevor earn for the two days?



## ■ Per Diem Employees

Some people are paid on a per diem basis. **Per diem** means “by the day.” Per diem employees are paid a fixed daily amount by their employer. Many per diem employees are temporary employees provided to a company by temporary help agencies.

Self-employed persons may charge a per diem rate for their services. These people may provide a specialized service to their clients. Self-employed persons work for themselves instead of for employers.

The gross pay of someone paid by the day is found by multiplying the per diem rate by the number of days worked.

$$\text{Per Diem Rate} \times \text{Number Of Days} = \text{Gross Pay}$$

## EXAMPLE 2

Shawn Traylor worked 5 days last week as a temporary computer operator. His per diem pay rate was \$120. What gross pay was Shawn paid for the week?

### SOLUTION

$$5 \times \$120 = \$600 \quad \text{gross pay for the week}$$

## ■ CHECK YOUR UNDERSTANDING

- C. Sherry McCoy is a tax consultant. She charges \$425 per diem for her services. If she worked 180 days last year, what was her gross income for the year?
- D. Charlie's neighbors are often out of town and they hire him to house-sit. They pay Charlie \$20 for each day they are gone. If they were out of town 57 days last year, what was Charlie's income from house sitting?

## ■ Tip Employees

Many workers receive income in the form of tips. A **tip** is an amount of money given to someone for services they provide. The person receiving the service pays tips voluntarily.

A tip, also called a *gratuity*, is often calculated as a percentage when there is a dollar value attached to the service. A waiter, for example, may receive a tip of 15% of the total restaurant bill.

$$\text{Tip Percent} \times \text{Total Bill} = \text{Tip Amount}$$

An airport skycap on the other hand, may receive a specific amount for each piece of luggage handled.

$$\text{Tip Per Unit} \times \text{Number of Units} = \text{Tip Amount}$$

Tipping practices vary considerably. The table below suggests guidelines for tipping certain types of workers. Most people round tips to the nearest quarter, or even dollar amount.

	Suggested Tipping Amounts
Airport skycap	\$1 per bag
Hair stylist	15% of cost, minimum \$1
Hotel chambermaid	\$5 to \$9 a night
Pizza delivery person	\$1 to \$5 depending on distance
Waiter/waitress	15-20% of total bill
Buffet waitstaff	5-10% of total bill
Taxi driver	15% of fare

### EXAMPLE 3

After the Sutton family finished their meal at a local restaurant, the waiter brought them a check for \$46.86. If Mrs. Sutton leaves a 20% tip, what amount of tip wages will the waiter receive for serving dinner to the Suttons? What will be the total meal cost to the Sutton's?



## SOLUTION

The check amount is multiplied by the tip percentage to find the amount of the tip. The tip is added to the check amount to find the meal's total cost.

$$20\% \times \$46.86 = 0.2 \times \$46.86 = \$9.372 \quad \text{round tip to } \$9.50$$

$$\$9.50 + \$46.86 = \$56.36 \quad \text{total meal cost}$$

## ■ CHECK FOR UNDERSTANDING

E. Jack orders the lunch special and a beverage. His check comes to \$10.20.

- 1) How much will the waitress receive if a 15% tip is left?
- 2) What is the total cost of the meal to Jack?

F. Lydia and Sarah share a cab ride to work. Their fare is \$7.60.

- 1) At 15%, how much should they tip the driver?
- 2) What is their total cost to ride the cab?

## Wrap Up

A waiter's total earnings for the first 3 months, or one quarter year, are \$5,610. Since there are 4 quarters in a year, multiply the total earnings for three months by 4 to find the total gross income for the year. So,  $\$5,610 \times 4 = \$22,440$  total annual gross income.

## Algebra Connection

Write the formula an employer uses to calculate a piece-rate gross pay where  $n$  represents the number of completed units,  $r$  represents the pay rate per unit, and  $G$  represents gross pay. Use the formula to find gross pay for 415 envelopes stuffed at a rate of \$0.20 each.

The formula may also be used to find the gross pay for per diem employees. Test the formula by finding gross pay for a food demonstrator who works 4 days a month at a rate of \$65 a day.

## EXERCISES

**Find the sum.**

1.  $40 + 38 + 39 + 45 + 41$
2.  $\$135 + \$18.60$

**Find the product.**

3.  $87 \times \$1.12$
4.  $3 \times \$97$
5.  $15 \times \$3 \times 5$

**Find the product.**

6.  $5\% \times \$38$
7.  $20\% \times \$187$
8.  $\$425 \times 22$

9. An airport skycap handled 520 bags in a weekend. His average tip per bag was \$1.25. What total earnings did he have from tips for the weekend?
10. A waitress in an exclusive restaurant presented a food and beverage check in the amount of \$340 to customers at a table. The customers decided to leave a 20% tip. What tip amount did the waitress receive?
11. Sandra Mitchell worked 22 days last month as a temporary employee in the Purchasing department. Her per diem pay was \$95. What were Sandra's total earnings for the month?
12. To meet a shortage of medical staff, a doctor agreed to work 6, 24-hour shifts in the emergency room of a hospital during the next year. She is paid \$950 for each shift worked. What total pay will the doctor receive for the 6 days of emergency room work?
13. Lu Ying works at the Wilkins Bike Shop and is paid \$3.25 for every bike he assembles. The shop owner charges customers \$20 for this service. During the five working days of one week, Lu assembled these numbers of bikes: 27, 33, 29, 27, 31. What was Lu's gross pay for that week?



**For each of these piece-rate employees at Dover Industries, find the total pieces produced and the gross pay for the week. Copy and complete the chart.**

	Name	M	T	W	T	F	Total pieces	Rate per piece	Gross Pay
14.	Zinke, T	54	55	59	62	60		\$1.60	
15.	Bello, V.	24	28	30	31	27		\$2.80	
16.	Dixon, S.	63	69	59	62	50		\$1.55	
17.	Maier, B.	68	65	72	74	75		\$1.18	

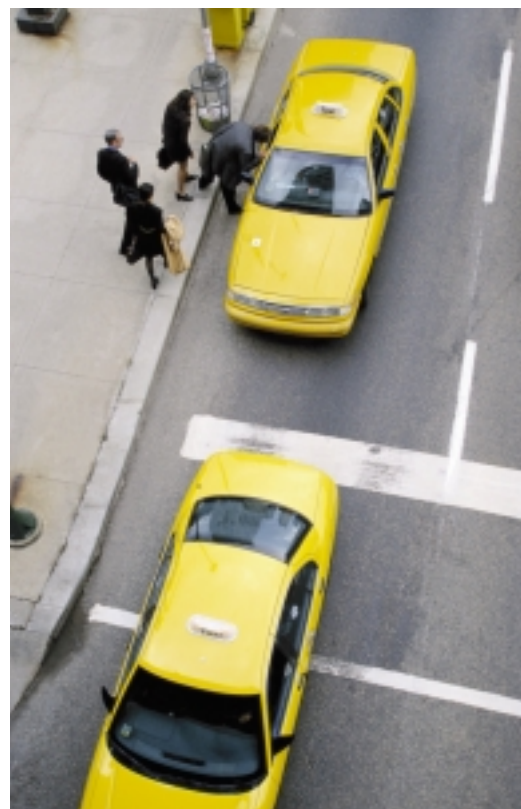
18. **DECISION MAKING** You and your partners are just starting a business. Since you are the manager, the partners are letting you decide whether to hire only regular, full-time employees or per diem employees who will work full time. Your other business partners told you that it may be less expensive for the first year of operation to hire per diem employees. You have to explain your decision to your partners. What will you tell them about your decision?

19. **CRITICAL THINKING** Steve took a taxi from the airport to his hotel across town. The fare came to \$19.30. Steve handed the driver a \$20 bill and told him to keep the change. Do you think Steve gave the driver a generous tip, an adequate tip, or not enough tip to express his appreciation for good service?

**INTEGRATING YOUR KNOWLEDGE** Fred must make a decision about keeping his current job, which he dislikes, or accepting an offer for a new job, which he thinks he would enjoy. His current job pays an hourly rate of \$12. Fred works 40 hours a week.

At the new job, Fred would earn \$0.80 for each item he produces up to 125 pieces per day. For each piece over 125 produced in a day, Fred would receive \$0.85. The average production rate is 15 pieces an hour. Because of his experience and skill, Fred believes that he can produce 18 an hour. At the new job, Fred would work 8 hours a day, 5 days a week.

20. What is the average weekly pay received by employees at the new job?
21. How much does Fred expect to make each week at the new job?
22. What is Fred's weekly pay at his current job?
23. Create a chart, like the one shown, that will allow you to compare both jobs by estimated daily, weekly, and annual earnings based on Fred's predictions that he will produce 18 pieces an hour.



	Current Job	New Job
Daily Earnings		
Weekly Earnings		
Annual Earnings		

## MIXED REVIEW

24.  $1\frac{5}{8} + 2\frac{3}{4}$       25.  $15 \div \frac{5}{8}$
26. What number increased by 8% of itself equals 1,944?
27. Bob Turnquist works 42 hours a week at a pay rate of \$12.50 an hour. What amount will Bob earn in 4 weeks?

**Brenda Peoples earned \$43,680 last year. Her usual work schedule is 50 hours a week. What were her average earnings**

28. per month?      29. per week?      30. per hour?
31. Danny Mills receives a salary of \$660 a month and a 7.5% commission on all sales above his monthly sales quota of \$15,000. His sales for February totaled \$32,000. What was Danny's total income for February?
32. A waitress at a Sunday brunch served 50 customers in a 4-hour period. The total of all the food and beverage checks she wrote for customers was \$1,500. Her customers left an average tip of 8%. What is her tip income for Sunday?

# Chapter Review

## Vocabulary Review

average

commission

double-time pay

graduated commission

gross pay

hourly rate

overtime

piece rate

per diem

quota

salary

straight commission

time-and-a-half pay

tip

Fill in each blank with one of the terms above. Use each term only once.

1. The total amount of an employee's earnings is called    ?   .
2. Pay that is 1.5 times the regular hourly pay rate of an employee is called    ?   .
3. An amount of money, often calculated as a percent, given to someone for service they provide is called (a, an)    ?   .
4. A fixed amount of pay for a week or a month is called    ?   .
5. Salespeople who receive a specific percent of the sales they make are paid on (a, an)    ?    basis.
6. One number that represents a group of numbers is called (a, an)    ?   .
7. Time worked beyond the end of a usual working day is called    ?   .
8. A wage rate based on the amounts produced by an employee is called    ?   .
9. Employees that are paid a fixed amount daily are called    ?    employees.

## LESSON 1.1

10. Raphael Winston is paid \$15.60 for each hour he works. What is his gross pay for a week in which he works 43 hours?
11. Karolyn Yoder is paid a salary of \$4,600 a month. What are her total annual earnings?

## LESSON 1.2

12. The gross earnings of 6 employees in a picture framing shop for a week were: \$620, \$524, \$715, \$670, \$588, and \$675. What was the average amount earned for the week by these employees?
13. For the 9 warmest months of the year Kendrick Beachom installed chain link fences and earned \$3,500 a month. For the remaining 3 months of the year he earned these monthly amounts by working several part-time jobs: \$2,450, \$1,785, \$3,025. What were his average monthly earnings for the year?
14. The average annual pay of 4 construction workers is \$46,800. Three of the workers earned these annual amounts of pay: \$44,200, \$47,450, and \$45,900. What was the annual pay of the fourth worker?

### LESSON 1.3

15. Monique Valla is paid an hourly rate of \$17.63 for regular-time work. What will be her time-and-a-half and double-time hourly pay rates for overtime work?
16. Raul Pina worked these hours in five days:  $8\frac{1}{4}$ ,  $7\frac{1}{2}$ , 10,  $8\frac{3}{4}$  and 8 hours. Overtime is based on an 8-hour workday. How many regular hours and overtime hours did he work in the five days?
17. Penelope Schoenberg's overtime is figured on a 40-hour week. Last week she worked 45.6 hours. This week she worked 9.7 hours on Monday, 8.3 hours on Tuesday, 8 hours on Wednesday, 9.1 hours on Thursday, and 8.6 hours on Friday. How many overtime hours did she work in the two weeks?
18. Eddie Fantin is paid every two weeks. For the first week of his pay period he worked 42 hours, 4 of which were overtime hours. In the second week he worked 40 regular hours and 7 overtime hours. His regular pay rate is \$14.40 an hour with time-and-a-half for overtime. What are his regular, overtime, and total wages for the two weeks?
19. Marcel Ouimet is paid \$9.80 an hour for regular time work and \$14.70 overtime pay for all hours worked beyond 40 hours in a week. He is paid every two weeks. During Week 1 he worked 46 hours; in Week 2 he worked  $42\frac{1}{4}$  hours. What was his total gross pay for the two weeks?

### LESSON 1.4

20. Gaston Kohl is paid a straight commission of 6.5% on all sales. In March his sales were \$105,000. What were his commission earnings in March?
21. A company pays sales staff a monthly commission of 4% on the first \$15,000 of sales, 6% on the next \$20,000 of sales, and 7.5% on all sales above \$35,000. What amount would Tony Renshaw earn if his sales for a month were \$41,000?
22. Irene Ogan earned a commission of \$5,130 on sales of \$90,000. What rate of commission was she paid?
23. Doris Bommarito is paid a commission of 1.4% on all monthly sales above \$80,000. Her sales for November were \$382,000. What commission amount did she earn for the month?

### LESSON 1.5

24. Steven Kahn is paid \$4.25 for each wooden duck he paints that passes inspection. What is his pay on a day when he paints 38 ducks, 2 of which were rejected?
25. Tammy Scott-Hogan charges \$350 a day to develop a personal training program for her clients. What amount did she earn last month if she worked 17 days?
26. What tip will Brady get if a customer adds a 15% tip to his \$18.52 meal cost?
27. Amanda delivers newspapers to subscription customers. She receives an average annual tip of \$12 from her 156 customers. What is her tip income for the year?



# Technology Workshop

## Task 1: Enter Data Into A Payroll Detail Template

You are to complete a template that calculates the weekly gross wages for each employee of the Bainbridge Company. All employees receive regular hourly pay for time worked and overtime pay for hours worked beyond 40 hours in a week.

Open the spreadsheet for Chapter 1 (tech1-1.xls). Next, enter into the spreadsheet the hours worked by each employee for the three days shown in blue cells (cells G5-I14). The spreadsheet will calculate regular, overtime, and total gross wages for each employee. When finished, your spreadsheet should look like the one shown below.

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P
1	<b>Bainbridge Company</b>														
2	<b>Payroll Detail Sheet for January 8, 20—</b>														
3	Employee No.	Name	Daily Hours Worked					Total Hours		Hourly Rate	Gross Wages				
M			T	W	T	F	S	S	Reg		O.T.	Reg	O.T.	Total	
5	1	Ajanaku	8.00	8.00	7.80	8.00	8.00	0.00	0.00	39.80	0.00	10.46	416.31	0.00	416.31
6	2	Bell	8.00	8.00	4.50	8.00	8.00	0.00	0.00	36.50	0.00	11.15	406.98	0.00	406.98
7	3	Cole	8.00	10.00	10.00	10.00	8.10	0.00	0.00	40.00	6.10	12.23	489.20	111.90	601.10
8	4	Dern	7.70	8.00	8.00	8.00	8.00	4.10	2.00	40.00	5.80	10.15	406.00	88.31	494.31
9	5	Evers	8.00	9.80	8.10	8.00	8.00	0.00	0.00	40.00	1.90	12.85	514.00	36.62	550.62
10	6	Ford	7.10	8.00	8.00	8.00	8.00	4.10	0.00	40.00	3.20	10.46	418.40	50.21	468.61
11	7	Gomez	8.00	8.00	8.00	8.00	8.00	3.90	2.00	40.00	5.90	12.35	494.00	109.30	603.30
12	8	Huang	8.00	9.30	8.00	8.00	8.00	0.00	0.00	40.00	1.30	11.70	468.00	22.81	490.82
13	9	Isom	8.00	8.00	5.40	8.00	8.00	0.00	0.00	37.40	0.00	11.32	423.37	0.00	423.37
14	10	Jackson	8.00	8.00	10.00	8.10	8.40	0.00	0.00	40.00	2.50	13.20	528.00	49.50	577.50
15		Totals											4,564.25	468.65	5,032.90
16															
17	Pay Raise Factor											1.000			

## Task 2: Analyze the Spreadsheet Output

Answer these questions about your completed payroll sheet.

1. What hourly pay rate did Dern have?
2. Which employee had the largest gross pay for the week?
3. Which employee worked the least regular-time hours?
4. Which employee worked the most overtime hours?
5. What was the total amount paid to all employees for overtime work?
6. What total gross pay was paid to employees for the one-week pay period?

Now move the cursor to cell M17, labeled Pay Raise Factor. The current entry in the cell should be 1.000. Now enter the 1.021. This change shows what would happen if the Bainbridge Company gives its employees a 2.1% pay increase. The increase would raise wages to 102.1%, or 1.021, of their current level. Notice how the hourly rate and the regular, overtime, and total gross wages figures changed for all workers.

**Answer these questions about your updated payroll sheet.**

7. What is the formula used in Cell N5? What does the formula calculate?
8. What is the formula used in Cell O7? What arithmetic is done in the cell?
9. What is the formula used in Cell P12? What does it do?
10. What hourly rate does Dern now earn? How much more per hour is Dern paid after the raise was calculated?
11. Find the difference between the original and the new total gross wages, then calculate the percent increase to the nearest tenth percent. What does your answer show?

### Task 3: Design a Sales Commission Spreadsheet

---

You are to design a spreadsheet that will compute the monthly earnings of salespersons that are paid monthly on a graduated commission basis.

The spreadsheet for Task 1 includes formulas that use subtraction, multiplication, the IF function, and the SUM function. Create a spreadsheet that will use similar math operators and functions. The spreadsheet should allow you to calculate the gross pay for a month for all employees listed. Your spreadsheet should contain a row for each employee. The column formulas should calculate the amount of commission earned by each employee for each commission level and the total gross wages for all employees.

**SITUATION:** You are the payroll clerk in the office of the Betadyne Company. The company pays its salespeople a commission on their sales. It does not pay them any salary. The employee names and their April sales are shown below on the left. Shown below on the right are the sales levels and rates by which your company figures commission payments.

Salesperson	April Sales
Boyce, Thad	\$53,000
Elkins, James	\$48,000
Kubik, Lucy	\$92,000
Mays, Nora	\$64,000

Betadyne Company Commission Structure
1.5% on all sales
3.4% of the first \$50,000 of sales
4.6% of all sales above \$50,000

### Task 4: Analyze the Spreadsheet Output

---

**Answer these questions about your completed spreadsheet.**

12. How did you figure the commission on all sales?
13. How did you test the spreadsheet to make sure the calculations were correct?
14. How would you change the spreadsheet to calculate the average gross commissions earned by employees?

# Chapter Assessment

## RATE YOUR KNOWLEDGE on a scale of 1–10

(10 being the highest) about

- gross pay
- overtime pay
- earning wages based on commission

What information and skills did you acquire that caused your self-rating to change?

## WRITE

Suppose that you live in Chicago, Illinois and interview for both of the jobs described in the classified advertisements shown below. Both companies are strong financially with equal growth potential and each offers you the job. Explain and show the computations that you need to make in order to decide which company is the best choice for you.

CAREGIVERS—\$100 signing bonus! Full-time work with individuals that have special medical needs. Travel to patients' homes. Annual salary range: \$32–\$38K depending on experience. Excellent benefits. For more information, please call 555-700-8000.

MEDICAL ASSISTANT needed for busy doctor's office. Seeking high-energy person to work full-time to assist with patients. Must have previous experience. Hourly-rate is \$16.85 with the possibility of overtime. Please fax resume to 555-700-1111, attn: Kim.

## SCANS

### Workplace Skills—Acquiring and Evaluating Information

These skills include the ability to see when information is needed, to gather information from a variety of sources, and to evaluate the usefulness of the information.

**Test Your Skills** Identify three jobs or industries that interest you. Look at a variety of resources such as job ads, the Internet, professional journals, library materials or direct contact with companies. Determine job titles. Name potential employers. List the skills each job requires. Mark each skill with either 1 (have the skill) or 2 (need to develop the skill).

**Make a Plan** From your three jobs or industries, choose the one that interests you the most. Create a plan that includes short-term goals and long-term goals to prepare you for a career in your chosen field.

**Summarize** Prepare in writing a speech that you could give that would influence an employer to hire you. Include references to your abilities in any of the following mathematical skills and how they apply to your ability to do this job.

*multiplication*  
*grouping data*

*division*  
*calculating pay*

*estimation*  
*using spreadsheets*

*rounding*  
*writing formulas*

## CHAPTER TEST

Answer each question.

1. Add:  $8\frac{1}{4} + 9 + 7\frac{1}{2} + 8 + 10\frac{1}{4}$
2. Subtract:  $47.3 - 37.5$
3. Multiply:  $38\frac{3}{4} \times \$13.35$ .
4. Divide:  $\$85,956 \div 52$
5. Rewrite 1.0567 as a percent.
6.  $30 \div \frac{5}{8} = ?$
7. What is 1.25% of \$34,500?
8. 120 is  $\frac{1}{4}$  greater than what number?
9. Write 5.68% as a decimal rounded to the nearest hundredth.
10. Round \$0.8794 to the nearest cent.
11. What number increased by 20% of itself equals \$103.20?

### Applications

12. Fiona Wolfe was paid \$9 an hour for 46 hours of work last week at her full-time job. She also worked 7 hours last week at a part-time job that pays \$11 an hour. What total gross pay did she earn last week from both jobs?
13. Zygmund Oleksik is paid a salary of \$800 a week to manage a party store. What amount will he make in one year working at this job?
14. Rosie Belin worked these total weekly hours in four weeks of work: 45, 38, 42, 43. Her job pays \$14 for each hour she works. What average gross pay did she earn per week for these four weeks of work?
15. The six employees in the security department of a company average \$120 gross pay a day. Three of the employees earn \$125 per day. Two others earn \$116.50 a day. How much does the sixth employee earn per day?
16. Frank Camp's regular hourly pay rate is \$11.87 an hour. His overtime pay rate is time-and-a-half. How much is Frank paid per hour for overtime work?
17. Justine Gilbert worked these hours last week: Monday, 8; Tuesday,  $10\frac{1}{4}$ ; Wednesday,  $8\frac{1}{2}$ ; Thursday, 9; Friday,  $7\frac{3}{4}$ . She works on an 8-hour day with time-and-a-half being paid for overtime work. Her regular gross pay rate is \$17.10 an hour. What was Justine's overtime pay amount for last week?
18. Barney Mullins' regular pay rate is \$14.85 an hour. He is paid time-and-a-half for hours worked over 40 hours in a week, including weekend work. He worked these hours from Monday through Saturday last week: 8.2, 8.9, 10.1, 9.6, 8.8, 6.7. What was his gross pay for the week?
19. Tiffany Penfield is paid a salary of \$750 a month at her sales job. She also earns a commission on her sales in this way: 2% on all sales up to \$34,000 in a month and 8% on all higher sales. What were Tiffany's total earnings for a month where her total sales were \$80,000?
20. All employees of the Crafton Company are paid \$0.375 for each wrench set they pack. How much would Kenny Pace earn if he packed 1,740 wrench sets in one week of work?