

Loans

Before YOU READ**What You'll Learn**

- Section 8-1** Compute the maturity value and interest rate of a single-payment loan.
- Section 8-2** Calculate the amount financed on an installment loan.
- Section 8-3** Figure out the monthly payment, total amount repaid, and finance charge on an installment loan.
- Section 8-4** Work out the payment to interest, payment to principal, and the new balance.
- Section 8-5** Compute the final payment of a simple interest installment loan.
- Section 8-6** Use a table to find the annual percentage rate of a loan.

When Will You Ever Use This?

Some day you might want to earn a college degree, buy a car, or purchase a home. Taking out a loan is a common way to borrow the money now and repay it later.

Key Words to Know

- single-payment loan
- promissory note
- maturity value
- term
- ordinary interest
- exact interest
- installment loan
- down payment
- amount financed
- simple interest installment loan
- annual percentage rate
- repayment schedule
- final payment

Mathematics Online

To learn more about loans, visit busmath.glencoe.com.



Living *in the* Real World

A Picture-Perfect Loan

Last winter photographer Al Chen hiked in the Chiricahua Mountains east of Tucson, Arizona. The area is not as high as many mountain ranges in North America (the summit of Chiricahua Peak is 9,795 feet above sea level). Chen hopes to return and tackle another week of camping and photography. He has four months before his trip and he knows he can't save enough money to pay for the equipment he wants. In this chapter learn how Chen contemplates taking out a small loan to afford a trip.

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<i>A Little Fatherly Advice</i>	p. 287
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SECTION 8-1 Single-Payment Loans

Section Objective

Compute the maturity value and interest rate of a single-payment loan.

A **single-payment loan** is a loan that you repay with one payment after a specified period of time. A **promissory note** is a type of single-payment loan. It is a written promise to pay a certain sum of money on a certain date in the future. The **maturity value** of the loan is the total amount you must repay. It includes both the principal and the interest owed. To review Chapter 5 content remember that principal is the amount borrowed.

You'll need to know the **term** of a loan. This is the amount of time for which the loan is granted. For example, a single-payment loan may be granted for a number of years, months, or days. When the term is a certain number of days, the lending agency may calculate interest in one of two ways: (1) **ordinary interest** or (2) **exact interest**. Here is an explanation on both kinds of interest:

- ordinary interest is calculated by basing the time of the loan on a 360-day year.
- exact interest is calculated by basing the time of the loan on a 365-day year.

Ask yourself these questions as you work through the problems:

Important Questions	What Formulas Do I Use?
How do I calculate interest? Then ask yourself . . . what do I need to find— ordinary interest or exact interest ?	$Interest = Principal \times Rate \times Time$ $Ordinary\ Interest = Principal \times Rate \times Time \div 360$ $Exact\ Interest = Principal \times Rate \times Time \div 365$
How do I calculate maturity value?	$Maturity\ Value = Principal + Interest\ Owed$

Living in the Real World

A Picture-Perfect Loan

When Your Dad Doesn't Have Deep Pockets Chen's friend Liz was the one who suggested taking out a loan. He'd never borrowed money from a bank before. Liz tells him that he can take out the loan and then sell his photos from the trip to help pay back the loan. Chen decides to look into the possibility of getting a loan for his trip.

Draw Conclusions How might a loan from Chen's dad be different than a loan from a bank?

Continued on page 287

Example 1

Anita Sloane's bank granted her a single-payment loan of \$7,200 for 91 days at 12 percent ordinary interest. What is the maturity value of the loan?

STEP 1: Find the ordinary interest owed.

Principal \times Rate \times Time

$$\$7,200.00 \times 12\% \times \frac{91}{360} = \$218.40$$

STEP 2: Find the maturity value.

Principal + Interest Owed

$$\$7,200.00 + \$218.40 = \$7,418.40 \text{ maturity value}$$



$$7200 \text{ M+ } \times \text{ 12 } \% \times \text{ 91 } \div \text{ 360 } =$$

$$218.4 \text{ M+ RM } 7418.4$$

Need Help? Go to...

Workshop 13:

Fractions to
Decimals, Decimals
to Percent, page 28

Skill 28: Writing

Percents as
Decimals, page 755

Skill 14: Changing

Fractions/Decimals,
page 741

Application J:

Fractional Parts of
a Year, page 766

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter.

1. Compute the ordinary interest and the maturity value.
 $\$600 \times 10\% \times 90 \div 360 =$
2. Compute the ordinary interest and the maturity value.
 $\$800 \times 12\% \times 75 \div 360 =$

CONCEPT CHECK

Example 2

Suppose Anita Sloane's bank granted her a single-payment loan of \$7,200 for 91 days at 12 percent exact interest. What is the maturity value of the loan?

STEP 1: Find the exact interest owed.

Principal \times Rate \times Time

$$\$7,200.00 \times 12\% \times \frac{91}{365} = \$215.408 \text{ or } \$215.41$$

STEP 2: Find the maturity value.

Principal + Interest Owed

$$\$7,200.00 + \$215.41 = \$7,415.41 \text{ maturity value}$$

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter.

3. Compute the exact interest and the maturity value.
 $\$600 \times 10\% \times 90 \div 365 =$
4. Compute the exact interest and the maturity value.
 $\$800 \times 12\% \times 75 \div 365 =$

CONCEPT CHECK

SECTION 8-2 Installment Loans

Section Objective

Calculate the amount financed on an installment loan.

An **installment loan** is a loan that you repay in several equal payments over a specified period of time. Usually when you purchase an item with an installment loan, you must make a down payment. The **down payment** is a portion of the cash price of the item you are purchasing. The **amount financed** is the portion of the cash price that you owe *after* making the down payment.

Ask yourself these questions as you work through the problems:

Important Questions	What Formulas Do I Use?
How do I calculate the amount financed?	$\text{Amount Financed} = \text{Cash Price} - \text{Down Payment}$
How do I find the down payment?	$\text{Down Payment} = \text{Amount} \times \text{Percent}$

Living in the Real World

A Picture-Perfect Loan

A Little Fatherly Advice Chen tells his father about his dream to return to the rugged Chiricahua Mountains and photograph them for his freelance photography business. He mentions he won't be able to save enough money by February so he wants to take out a loan from a bank.

Mr. Chen thinks this is a great idea because it'll teach Chen financial responsibility, and require him to start paying the money back in installments (as opposed to whenever he feels like it).

Draw Conclusions Mr. Chen explains that taking out a loan is certainly possible but that there are restrictions on the amount of money Chen can borrow. Before the bank will give Chen a loan, what does he have to do first?

Continued on page 290

Need Help? Go to...

- **Workshop 14:**
Finding a Percentage, page 30
- **Workshop 13:**
Fractions to Decimals, Decimals to Percents, page 28
- **Workshop 2:**
Rounding Numbers, page 6
- **Application A:**
Formulas, page 760

Example 1

Tasheka Quintero is buying a new refrigerator for \$1,399. Quintero made a down payment of \$199 and financed the remainder. How much did Quintero finance?

STEP: Find the amount financed.

$$\begin{array}{r r r r r} \text{Cash Price} & - & \text{Down Payment} & & \\ \$1,399 & - & \$199 & = & \$1,200 \text{ financed} \end{array}$$

CONCEPT CHECK

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter. Determine the amount financed.

1. Big-screen television set.
Cash price of \$1,999.99.
Down payment of \$199.99.
2. Office computer.
Cash price of \$3,950.
Down payment of \$150.

Example 2

Rebecca Clay purchased a washer and a dryer for \$1,140. She used the store's installment credit plan to pay for the items. She made a down payment and financed the remaining amount. What amount did she finance if she made a 20 percent down payment?

STEP 1: Find the 20 percent down payment.

$$\$1,140 \times 20\% = \$228$$

STEP 2: Find the amount financed.

$$\begin{array}{r} \text{Cash Price} \\ \$1,140 \end{array} - \begin{array}{r} \text{Down Payment} \\ \$228 \end{array} = \$912 \text{ financed}$$



$$1140 \text{ M+ } \times \text{ 20 \% } 228 \text{ M- RM } 912$$

CONCEPT CHECK

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter. Find the down payment and the amount financed.

3. Waterbed.
Cash price of \$1,360.
Twenty percent down payment.
4. Television set.
Cash price of \$725.
Thirty percent down payment.

SECTION 8-2 PRACTICE

	Cash Price	Down Payment (Cash)	Down Payment (Percent)	Down Payment (in Dollars)	Amount Financed
5.	\$ 640	\$ 120	—	a.	b.
6.	4,860	1,400	—	a.	b.
7.	9,774	1,500	—	a.	b.
8.	3,600	—	40%	a.	b.
9.	9,480	—	15%	a.	b.
10.	5,364	—	25%	a.	b.



What influences your credit rating? Timely payments and the amount of debt you're carrying affect it.



11. Cash price of \$1,265.
Down payment of \$100.
What amount is financed?
12. Cash price of \$14,470.
Down payment of \$3,000.
What amount is financed?
13. Cash price of \$8,371.39.
Down payment of 15 percent.
What amount is financed?
14. Cash price of \$18,936.50.
Down payment of 30 percent.
What amount is financed?
15. Milt Gibson purchased computer equipment for \$4,020. He used the store's credit plan. He made a 20 percent down payment. What amount did he finance?
16. Linda Chevez purchased a stereo for her car. The stereo cost \$279.50. Using the store's credit plan, she made a \$50.00 down payment. What amount did she finance?
17. Ardella Haubert purchased living room furniture for \$3,987.95. She made a down payment of 20 percent and financed the remaining amount using the store's installment plan. What amount did she finance?
18. Bev and Tom Hoffman went on a two-week vacation at a total cost of \$2,876. They financed the trip through State Bank. They made a 25 percent down payment and financed the remaining amount on the installment plan. What amount did they finance?
19. Amy and Cliff Martin want to remodel their kitchen. They would like to finance part of the cost but do not want the amount financed to be more than \$9,000. The total cost of remodeling the kitchen is \$12,000. What percent of the total cost should their down payment be?
20. Mack Casey wants to purchase a car costing \$14,590. He will finance the car with an installment loan from the bank but would like to finance no more than \$10,000. What percent of the total cost of the car should his down payment be?

MAINTAINING YOUR SKILLS

Write the percents as decimals.

- | | | |
|---------|---------|---------|
| 21. 32% | 22. 45% | 23. 25% |
|---------|---------|---------|

Find the percentage.

- | | | |
|-----------------------|-----------------------|-------------------------|
| 24. $440 \times 30\%$ | 25. $325 \times 20\%$ | 26. $1,240 \times 25\%$ |
|-----------------------|-----------------------|-------------------------|

Round to the nearest cent.

- | | | |
|---------------|----------------|---------------|
| 27. \$49.9638 | 28. \$178.3813 | 29. \$413.995 |
|---------------|----------------|---------------|

Need Help? Go to...

- Skill 28: Writing Percents as Decimals, page 755
- Skill 30: Finding the Percentage, page 757
- Skill 2: Rounding Numbers, page 729



SECTION 8-3

Simple Interest Installment Loans

Section Objective

Figure out the monthly payment, total amount repaid, and finance charge on an installment loan.

When you obtain a **simple interest installment loan**, you must pay finance charges for the use of the money. You repay the loan with equal monthly payments, where part of each payment is used to pay the interest on the unpaid balance of the loan. And the remaining part of the payment is used to reduce the balance.

Usually you repay the amount financed plus the finance charge in equal monthly payments. The amount of each monthly payment depends on the amount financed, the number of payments, and the **annual percentage rate** (APR). The annual percentage rate is an index showing the relative cost of borrowing money.

Ask yourself these questions as you work through the problems:

Important Questions	What Formulas Do I Use?
How do I find the monthly payment ?	$\text{Monthly Payment} = \frac{\text{Amount of Loan}}{\$100} \times \text{Monthly Payment for a \$100 Loan}$
How do I calculate the total amount paid ?	$\text{Total Amount Repaid} = \text{Number of Payments} \times \text{Monthly Payments}$
How do I find the finance charge ?	$\text{Finance Charge} = \text{Total Amount Repaid} - \text{Amount Financed}$

Living in the Real World

A Picture-Perfect Loan

A Model for Improvement Mr. Chen uses a home remodeling loan as a model for his son. "It's important to understand that with a simple interest installment loan, you'll be paying back the amount you borrow plus finance charges each month," Mr. Chen says.

Draw Conclusions What do you think a bank looks for in a client who wants to take out a personal loan?

Continued on page 294

Example 1

Clara Hart obtained an installment loan of \$1,800.00 to purchase some new furniture. The annual percentage rate is 8 percent. She must repay the loan in 18 months. What is the finance charge?

Need Help? Go to...

- ▶ **Workshop 6:**
Multiplying
Decimals, page 14
- ▶ **Workshop 5:**
Subtracting
Decimals, page 12
- ▶ **Workshop 18:**
Reading Tables and
Charts, page 38
- ▶ **Application C:**
Tables and Charts,
page 762

STEP 1: Find the monthly payment. (Refer to the Monthly Payment on a Simple Interest Installment Loan of \$100 table on page 799.)

$$\frac{\text{Amount of Loan}}{\$100} \times \text{Monthly Payment for a \$100 Loan}$$

$$\frac{\$1800.00}{\$100.00} \times \$5.91 = \$106.38$$

STEP 2: Find the total amount repaid.

$$\text{Number of Payments} \times \text{Monthly Payment}$$

$$18 \times \$106.38 = \$1,914.84$$

STEP 3: Find the finance charge.

$$\text{Total Amount Repaid} - \text{Amount Financed}$$

$$\$1,914.84 - \$1,800.00 = \$114.84 \text{ finance charge}$$



$$1800 \text{ M+ } \div 100 \times 5.91 = 106.38 \times 18 =$$

$$1914.84 - \text{RM } 1800 = 114.84$$

CONCEPT CHECK

SELF-CHECK

Complete the problem, then check your answers at the end of the chapter.

1. Find the monthly payment, total amount repaid, and the finance charge for a \$1,600.00 installment loan at 10 percent for 24 months.

Example 2

Tulio and Lupe Fernandez are purchasing a side-by-side refrigerator with an installment loan that has an APR of 12 percent. The refrigerator sells for \$1,399.99. The store financing requires a 10 percent down payment and 12 monthly payments. What is the finance charge?

STEP 1: Find the amount financed.

$$\text{Selling Price} - \text{Down Payment}$$

$$\$1,399.99 - (0.10 \times \$1,399.99)$$

$$\$1,399.99 - \$140.00 = \$1,259.99$$

STEP 2: Find the monthly payment. (Refer to the Monthly Payment on a Simple Interest Installment Loan of \$100 table on page 799.)

$$\frac{\text{Amount of Loan}}{\$100} \times \text{Monthly Payment for a \$100 Loan}$$

$$\frac{\$1259.99}{\$100.00} \times \$8.88$$

$$= \$111.887 \text{ or } \$111.89 \text{ monthly payment}$$

STEP 3: Find the total amount repaid.

$$\text{Number of Payments} \times \text{Monthly Payment}$$

$$12 \times \$111.89 = \$1,342.68$$

STEP 4: Find the finance charge.

$$\text{Total Amount Repaid} - \text{Amount Financed}$$

$$\$1,342.68 - \$1,259.99 = \$82.69 \text{ finance charge}$$



CONCEPT CHECK

SELF-CHECK

Complete the problem, then check your answers at the end of the chapter.

2. Find the down payment, amount financed, monthly payment, total amount repaid, and the finance charge for a \$4,000.00 used boat, with a 20 percent down payment and an installment loan at an APR of 10 percent interest for 36 months.

SECTION 8-3 PRACTICE

Use the **Monthly Payment on a Simple Interest Installment Loan of \$100** table on page 799 to solve the following.

	APR	Term (Months)	Table Value	Amount Financed	Monthly Payment	Total Repaid	Finance Charge
3.	10%	6	a.	\$1,000	b.	c.	d.
4.	12%	18	a.	2,000	b.	c.	d.
5.	8%	24	a.	5,600	b.	c.	d.
6.	9%	30	a.	9,900	b.	c.	d.
7.	8%	36	a.	9,550	b.	c.	d.

8. Hazel Basnett.
Installment loan of \$2,000.
Requires 12 monthly payments.
APR is 8 percent.
 - a. What are the monthly payments?
 - b. What is the finance charge?
9. Brian Anderson.
Installment loan of \$1,250.
Requires 24 monthly payments.
APR is 10 percent.
 - a. What are the monthly payments?
 - b. What is the finance charge?
10. Used boat loan for \$12,000.
Down payment of 25 percent.
A 9 percent APR for 36 months.
 - a. What is the down payment?
 - b. What is the amount of the loan?
 - c. What are the monthly payments?
 - d. What is the finance charge?
11. Equipment loan for \$20,000.
Down payment of 20 percent.
A 12 percent APR for 30 months.
 - a. What is the down payment?
 - b. What is the amount of the loan?
 - c. What are the monthly payments?
 - d. What is the finance charge?
12. Bob Wozniak obtained an installment loan of \$2,400 to put a new roof on his house. The APR is 12 percent. The loan is to be repaid in 36 monthly payments. **(You may need to refer to the Monthly Payment on a Simple Interest Installment Loan of \$100 table on page 799.)** What is the finance charge?
13. Jim Wilson obtained an installment loan of \$1,450 to pay for some new furniture. He agreed to repay the loan in 18 monthly payments at an APR of 8 percent. What is the finance charge?

14. Mark and Pam Voss obtained an installment loan of \$2,460. The APR is 9 percent for 12 monthly payments. What is the finance charge?
15. Herb and Marci Rahla are purchasing a dishwasher with an installment loan that has an APR of 10 percent. The dishwasher sells for \$699.95. They agree to make a down payment of 20 percent and to make 12 monthly payments. What is the finance charge?
16. Adolfo Ramirez obtained an installment loan of \$6,800 for a used car. He made an \$800 down payment. He financed the purchase with a finance company and agreed to repay the loan in 24 monthly payments at an APR of 8 percent. What is the finance charge?
17. Aurora Kaylow obtained an installment loan of \$6,000 on a used sailboat. She financed the purchase through the boat dealer and agreed to repay the loan in 48 monthly payments at an APR of 10 percent. What is the finance charge?
18. Andrew and Ruth Bacon would like to obtain an installment loan of \$1,850 to repair the gutters on their home. They can get the loan at an APR of 8 percent for 24 months or at an APR of 11 percent for 18 months. How much do the Bacons save by taking the loan with the lowest finance charge?
19. Lola Samaria would like an installment loan of \$1,200 for auto repairs. Walton Savings and Loan will loan her the money at 9 percent for 12 months. Horton Finance Company will loan her the money at 12 percent for 24 months. How much will she save by taking the loan with the lowest finance charge?
20. Pauline and Eldon Kharche would like to obtain an installment loan of \$9,800 for replacement windows in their home. They can get the loan at an APR of 8 percent for 24 months or at an APR of 11 percent for 18 months. Which loan costs less? How much do the Kharches save by taking the loan that costs less?
21. Lucretia and Don Protsman would like an installment loan of \$12,900. City Loan will loan the money at 10 percent for 24 months. Economy Line Finance Company will loan the money at 9 percent for 30 months. Which loan costs less? How much will be saved by taking the loan that costs less?

Need Help? Go to...

- ▶ Skill 30: Finding the Percentage, page 757
- ▶ Skill 20: Multiplying Fractions/Mixed Numbers, page 747
- ▶ Skill 6: Subtracting Decimals, page 733

MAINTAINING YOUR SKILLS

Multiply. Round to the nearest thousandth.

22. $4,000.00 \div 100.00 \times 3.33$

23. $1,240.00 \div 250.00 \times 5.09$

Subtract.

24.
$$\begin{array}{r} 4,200 \\ - \quad 42 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 1,240 \\ - \quad 15.50 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 1,224.50 \\ - \quad 15.31 \\ \hline \end{array}$$

SECTION 8-4

Installment Loans— Allocation of Monthly Payment

Section Objective

Work out the payment to interest, payment to principal, and the new balance.

As you learned in Section 8-3, a simple interest installment loan is repaid in equal monthly payments. Part of each payment is used to pay the interest on the unpaid balance of the loan and the remaining part is used to reduce the balance. The interest is calculated each month using the simple interest formula. The amount of principal that you owe *decreases* with each monthly payment. A **repayment schedule** shows the distribution of interest and principal over the life of the loan. The repayment schedule in **Figure 8.1** shows the interest and principal on an installment loan of \$1,800 for 6 months at 8 percent.

Figure 8.1

Repayment Schedule for a \$1,800 Loan at 8.0% for 6 Months				
Payment Number	Monthly Payment	Amount for Interest	Amount for Principal	Balance
				\$1,800.00
1	\$307.08	\$12.00	\$295.08	\$1,504.92
2	307.08	10.03	297.05	1,207.87
3	307.08	8.05	299.03	908.85
4	307.08	6.06	301.02	607.82
5	307.08	4.05	303.03	304.80
6	307.08	2.03	305.05	-0.25

Note that the last payment would be reduced by \$0.25 in order to zero out the loan.

Important Questions	What Formulas Do I Use?
What's the formula for interest ?	$Interest = Principal \times Rate \times Time$
How do I find the payment to principal ?	$Payment\ to\ Principal = Monthly\ Payment - Interest$
How do I find the new principal ?	$New\ Principal = Previous\ Principal - Payment\ to\ Principal$

Living in the Real World

A Picture-Perfect Loan

It's Payback Time Chen reads the bank's brochure. The pamphlet contains a chart that shows a repayment schedule for a \$2,000 loan at 6.0 percent interest for 8 months.

Each month you pay proportionately less for interest and more on your principal as you approach the end of your loan period.

Draw Conclusions Why is it important to get a copy of your repayment schedule?

Continued on page 297

Example 1

Need Help? Go to...

- ▶ **Workshop 5:**
Subtracting
Decimals, page 12
- ▶ **Workshop 6:**
Multiplying
Decimals, page 14
- ▶ **Workshop 14:**
Finding a
Percentage, page 30
- ▶ **Application A:**
Formulas, page 760

Stephanie and Donald Cole obtained the loan of \$1,800 at 8 percent for 6 months shown in the repayment schedule in Figure 8.1 on page 294. Show the calculation for the first payment. What is the interest? What is the payment to principal? What is the new principal?

STEP 1: Find the interest.

Principal \times Rate \times Time

$$\$1,800.00 \times 8\% \times \frac{1}{12} = \$12.00 \text{ interest}$$

STEP 2: Find the payment to principal.

Monthly Payment $-$ Interest

$$\$307.08 - \$12.00 = \$295.08 \text{ payment to principal}$$

STEP 3: Find the new principal.

Previous Principal $-$ Payment to Principal

$$\$1,800.00 - \$295.08 = \$1,504.92 \text{ new principal}$$

CONCEPT CHECK

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter.

1. Interest the second month is: $\$1,504.92 \times 8\% \times \frac{1}{12} =$
2. Payment to principal is: $\$307.08 - ? =$
3. The new balance is: $\$1,504.92 - ? =$

Example 2

Carlo Blanco obtained a home improvement loan of \$6,000.00 at 8 percent for 36 months. The monthly payment is \$187.80. The balance of the loan after 20 payments is \$2,849.08. What is the interest for the first payment? What is the interest for the 21st payment? Why is the interest so much different for the two payments?

STEP 1: Find the interest for the first payment.

Principal \times Rate \times Time

$$\$6,000.00 \times 8\% \times \frac{1}{12} = \$40.00$$

STEP 2: Find the interest for the 21st payment.

Principal \times Rate \times Time

$$\$2,849.08 \times 8\% \times \frac{1}{12} = \$18.99$$

The interest is reduced by more than half. The principal is much greater for the first payment than the second payment.

CONCEPT CHECK

SELF-CHECK

Complete the problem, then check your answers at the end of the chapter.

4. You take out a loan of \$8,000.00 at 12 percent for 24 months. The monthly payment is \$376.80. The balance of the loan after 15 payments is \$3,222.44.
 - a. What is the interest for the first payment?
 - b. What is the interest for the 16th payment?

SECTION 8-4 PRACTICE

	Loan Balance	Interest Rate	Monthly Payment	Amount for Interest	Amount for Principal	New Principal
5.	\$1,200	12%	\$106.56	\$12.00	\$94.56	a.
6.	2,400	8%	141.84	16.00	a.	b.
7.	3,460	10%	207.95	a.	b.	c.
8.	1,011	10%	207.95	a.	b.	c.
9.	7,200	9%	329.04	a.	b.	c.
10.	3,599	11%	318.15	a.	b.	c.

For Problems 11–17, complete the repayment schedule for a loan of \$2,400 at 12 percent for 12 months.

Repayment Schedule for a \$2,400 Loan at 12% for 12 Months					
	Payment Number	Monthly Payment	Amount for Interest	Amount for Principal	New Principal
	1	\$213.12	\$24.00	\$189.12	\$2,210.88
	2	213.12	22.11	191.01	2,019.87
	3	213.12	20.20	192.92	1,826.95
	4	213.12	18.27	194.85	1,632.10
	5	213.12	16.32	196.80	1,435.30
11.	6	213.12	14.35	198.77	a.
12.	7	213.12	12.37	a.	b.
13.	8	213.12	a.	b.	c.
14.	9	213.12	a.	b.	c.
15.	10	213.12	a.	b.	c.
16.	11	213.12	a.	b.	c.
17.	12	a.	b.	c.	d.

MAINTAINING YOUR SKILLS

Need Help? Go to...

▶ Skill 30: Finding the Percentage, page 757

Find the percentage.

- | | | |
|-----------------------|-----------------------|-----------------------|
| 18. 12% of \$5,000 | 19. 15% of \$6,000 | 20. 8% of \$8,400 |
| 21. 22% of \$1,282.15 | 22. 26% of \$2,348.90 | 23. 20% of \$456.21 |
| 24. 6% of \$340.80 | 25. 15% of \$9,845.20 | 26. 7% of \$12,346.97 |

SECTION 8-5

Paying Off Simple Interest Installment Loans

Section Objective

Compute the final payment when paying off a simple interest installment loan.

When you have a simple interest installment loan, you pay interest on the unpaid balance. If you pay off a simple interest installment loan before the end of the term, you just pay the previous balance plus the current month's interest. This is the **final payment**.

One reason to pay off a simple interest installment loan before the end of the term is to pay less interest. The amount of interest saved depends on the total payback minus the sum of the previous payments and the final payment.

Ask yourself these questions as you work through the problems:

Important Questions	What Formulas Do I Use?
How do I calculate interest?	$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$
How do I find the final payment?	$\text{Final Payment} = \text{Previous Balance} + \text{Current Month's Interest}$
How do I determine the interest saved?	$\text{Interest Saved} = \text{Total Payback} - (\text{Sum of Previous Payments} + \text{Final Payment})$

Living in the Real World

A Picture-Perfect Loan

You Need a Plan Chen thinks he could pay off this loan early if he sells some of his photographs from his trip as soon as he gets back.

Mr. Chen smiles, "Make sure you talk with the loan officer about that possibility. The bank will explain how a payoff works. Generally, the bank still gets some interest on the loan on the final payoff."

Draw Conclusions Why might a bank not encourage you to pay off a loan early?

Continued on page 300

Example 1

The first 3 months of the repayment schedule for Doug and Donna Collins's loan of \$1,800 at 12 percent interest for 6 months is shown in Figure 8.2 on page 298. What is the final payment if they pay the loan off with the fourth payment?

Continued on next page



Figure 8.2

Repayment Schedule for a \$1,800 Loan at 12.0% for 6 Months				
Payment Number	Monthly Payment	Amount for Interest	Amount for Principal	Balance
				\$1,800.00
1	\$310.50	\$18.00	\$292.50	\$1,507.50
2	310.50	15.08	295.42	1,212.08
3	310.50	12.12	298.38	913.70

Need Help? Go to...

- ▶ **Workshop 4:**
Adding Decimals,
page 10
- ▶ **Workshop 5:**
Subtracting
Decimals, page 12
- ▶ **Workshop 6:**
Multiplying
Decimals, page 14
- ▶ **Workshop 14:**
Finding a
Percentage, page 30

STEP 1: Find the previous balance.

$$= \$913.70.$$

STEP 2: Find the interest for the fourth month.

Principal \times Rate \times Time

$$\$913.70 \times 12\% \times \frac{1}{12} = \$9.137 \text{ or } \$9.14$$

STEP 3: Find the final payment.

Previous Balance + Current Month's Interest

$$\begin{array}{rclcl}
 \$913.70 & + & \$9.14 & = & \text{\$922.84 final} \\
 & & & & \text{payment}
 \end{array}$$

CONCEPT CHECK

SELF-CHECK

Complete the problems, then check your answers at the end of the chapter.

1. Find the interest for a month and then the final payment for a previous balance of \$800 at 10 percent interest.
2. You have a 12-month loan of \$1,200.00 at 12 percent interest with a balance of \$816.04 after the fourth payment. What is the final payment if you pay off the loan with the fifth payment?

Example 2

How much would the Collinses in Example 1 save by paying off the loan early?

STEP: Find the interest saved.

$$\begin{array}{rclcl}
 \text{Total Payback} & - & (\text{Sum of Previous Payments} & + & \text{Final Payment}) \\
 (6 \times \$310.50) & - & [(3 \times \$310.50) & + & \$922.84] \\
 = \$1,863.00 & - & [\$931.50 & + & \$922.84] \\
 = \$1,863.00 & - & & & \$1,854.34 \\
 = \text{\$8.66 saved} & & & &
 \end{array}$$

CONCEPT CHECK

SELF-CHECK

Complete the problem, then check your answer at the end of the chapter.

3. In Problem 2 you had a 12-month loan of \$1,200.00 at 12 percent interest with a balance of \$816.04 after the fourth payment of \$106.56. How much do you save by paying off the loan with the fifth payment?

Find the interest and the final payment.

	Interest Rate	Previous Balance	Interest	Final Payment
4.	12%	\$4,800.00	a.	b.
5.	8%	3,000.00	a.	b.
6.	10%	1,460.80	a.	b.
7.	9%	3,987.60	a.	b.
8.	11%	3,265.87	a.	b.

9. Willard Hudson took out a simple interest loan of \$6,000.00 at 10 percent interest for 24 months. His monthly payment is \$276.60. After 4 payments the balance is \$5,082.21. He pays off the loan when the next payment is due. What is the interest? What is the final payment? How much is saved by paying the loan off early?
10. Lillian Hartwick took out a simple interest loan of \$3,600.00 at 8 percent for 12 months with a payment of \$313.20. After 6 payments the balance is \$1,835.62. She pays off the loan when the next payment is due. What is the interest? What is the final payment? How much is saved by paying the loan off early?
11. Scott DuBois took out a simple interest loan of \$1,800.00 for home repairs. The loan is for 12 months at 8 percent interest with a payment of \$156.60. After 8 months, the balance is \$615.87. He pays off the loan when the next payment is due. What is the final payment? How much is saved by paying the loan off early?
12. Nicholas and Dorothea Schrodtr were looking over the repayment schedule for their boat loan of \$5,500.00 at 15 percent interest for 42 months with a payment of \$168.85. They note the following:
- Balance after payment 18 is \$3,493.39.
 - Balance after payment 24 is \$2,718.43.
 - Balance after payment 30 is \$1,883.50.
- How much is saved by paying off the loan early at payment 19, 25, and 31?

MAINTAINING YOUR SKILLS

Need Help? Go to...

- Skill 8: Multiplying Decimals, page 735
- Skill 30: Finding the Percentage, page 757

Multiply.

13. $5,489 \times 0.15$

14. $2,729 \times 0.22$

15. $9,032 \times 0.18$

Find the percentage.

16. $430 \times 18\%$

17. $3,561.90 \times 9\%$

18. $\$10,907.45 \times 15\%$

SECTION 8-6 Determining the APR

Section Objective

Use a table to find the annual percentage rate of a loan.

If you know the number of monthly payments and the finance charge per \$100 of the amount financed, you can use a table to find the annual percentage rate (APR) of the loan. You can use the APR of loans to compare the relative cost of borrowing money.

Figure 8.3

Annual Percentage Rate for Monthly Payment Plans											
Annual Percentage Rate											
	10.00%	10.25%	10.50%	10.75%	11.00%	11.25%	11.50%	11.75%	12.00%	12.25%	12.50%
Term	Finance Charge per \$100 of Amount Financed										
6	\$ 2.94	\$ 3.01	\$ 3.08	\$ 3.16	\$ 3.23	\$ 3.31	\$ 3.38	\$ 3.45	\$ 3.53	\$ 3.60	\$ 3.68
12	5.50	5.64	5.78	5.92	6.06	6.20	6.34	6.48	6.62	6.76	6.90
18	8.10	8.31	8.52	8.73	8.93	9.14	9.35	9.56	9.77	9.98	10.19
24	10.75	11.02	11.30	11.58	11.86	12.14	12.42	12.70	12.98	13.26	13.54

Note: An expanded table can be found in the Appendix on pages 794–795.

As you work through the problems, you will need this important formula:

$$\text{Finance Charge per } \$100 = \$100 \times \frac{\text{Finance Charge}}{\text{Amount Financed}}$$

Living in the Real World

A Picture-Perfect Loan

How Much Are Your Dreams Worth? Still studying the brochure, Chen finds one chart that shows the annual percentage rates (APR) of the home improvement loan Chen's parents borrowed. The chart shows various finance charges per \$100 borrowed. The figures vary according to the length of the loan and the annual percentage rate of the loan. He figures out the APR and term of loan that will suit his needs best, and tomorrow he'll talk with the bank's loan officer to negotiate a loan.

Draw Conclusions Given Chen's situation, do you think it's a good idea to take out a loan for a vacation? Or should he wait and save up money in order to afford the trip?

Continued on page 305

Example 1

Paul Norris obtained an installment loan of \$1,500.00 to pay for a computer. The finance charge is \$146.25. He agreed to repay the loan in 18 monthly payments. What is the annual percentage rate?

Need Help? Go to...

- **Workshop 7:**
Dividing Decimals,
page 16
- **Workshop 2:**
Rounding Numbers,
page 6
- **Skill 11:** Dividing
Decimals, page 738
- **Skill 2:** Rounding
Numbers, page 729

STEP 1: Find the finance charge per \$100.

$$\begin{aligned} & \$100 \times \frac{\text{Finance Charge}}{\text{Amount Financed}} \\ & \$100 \times \frac{\$146.25}{\$1,500.00} \\ & \$100 \times 0.0975 = \$9.75 \end{aligned}$$

STEP 2: Find the APR. (Refer to Figure 8.3, the Annual Percentage Rate for Monthly Payment Plans table on page 300.)

In the row for 18 payments, find the number closest to \$9.75. It is \$9.77. Read the APR at the top of the column. **APR is 12.00 percent.**

CONCEPT CHECK

Complete the problems, then check your answers at the end of the chapter. Find the finance charge per \$100 and the APR.

1. A 6-month loan.
Finance charge: \$24.64.
Amount financed of \$800.
2. A 24-month loan.
Finance charge: \$96.22.
Amount financed of \$850.

SELF-CHECK

Example 2

A 54-inch HDTV is for sale for \$1,899.92 cash or \$166.10 per month for 12 months. What is the APR?

STEP 1: Find the finance charge.

$$\begin{aligned} & \text{Total Payback} - \text{Amount Financed} \\ & (12 \times \$166.10) - \$1,899.92 = \\ & \$1,993.20 - \$1,899.92 = \$93.28 \end{aligned}$$

STEP 2: Find the finance charge per \$100.

$$\begin{aligned} & \$100 \times \frac{\text{Finance Charge}}{\text{Amount Financed}} \\ & \$100 \times \frac{\$93.28}{\$1,899.92} \\ & \$100 \times 0.04909 = \$4.91 \end{aligned}$$

STEP 3: Find the APR. (Refer to the Annual Percentage Rate for Monthly Payment Plans table on pages 794–795.)

In the row of 12 payments, find the number closest to \$4.91. It is \$4.94. Read the APR at the top of the column. **APR is 9.00 percent.**

CONCEPT CHECK

Complete the problem, then check your answer at the end of the chapter.

3. A home improvement loan of \$4,000.00 has payments of \$186.00 per month for 24 months. What is the APR?

SELF-CHECK

SECTION 8-6 PRACTICE

Complete the table. Using the Annual Percentage Rate for Monthly Payment Plans table on pages 794–795, find the finance charge per \$100 and the APR.

	Finance Charge	Amount Financed	Finance Charge per \$100	Number of Payments	Annual Percentage Rate
4.	\$ 33.10	\$1,000	a.	6	b.
5.	159.36	2,400	a.	24	b.
6.	108.00	3,000	a.	18	b.
7.	691.74	5,400	a.	36	b.
8.	597.66	4,200	a.	30	b.

9. Ed Naiman.
Installment loan of \$2,500.00.
Finance charge of \$193.25.
Requires 24 monthly payments.
What is the APR?
10. Betty Arca.
Installment loan of \$800.00.
Finance charge of \$40.72.
Requires 36 monthly payments.
What is the APR?
11. Webster Larkin.
Installment loan of \$3,000.00.
Requires 6 monthly payments of \$511.18.
What is the APR?
12. Kenneth Bryant.
Installment loan of \$9,365.
Requires 36 monthly payments of \$284.90.
What is the APR?
13. Marie Brenson obtained an installment loan of \$460.00 to purchase computer software. The finance charge is \$7.41. She agreed to repay the loan in 6 monthly payments. What is the APR rate?
14. Herb Stanley acquired an installment loan of \$6,800.00 to pay his daughter's college tuition. The finance charge is \$731. He agreed to repay the loan in 24 monthly payments. What is the APR?
15. Jeff Stapleton acquired an installment loan of \$1,995.00 to pay for truck transmission repairs. He agreed to repay the loan in 12 monthly payments of \$174.70. What is the APR?
16. Julia Bourne obtained an installment loan of \$3,800.00 to purchase a lawn and garden tractor. She agreed to repay the loan in 24 monthly payments of \$167.15. What is the APR?
17. Oneta Correy wants to obtain an installment loan of \$9,900.00 to purchase a used truck. The bank has agreed to loan her the money for 24 months at \$439.89 per month. What is the APR of her loan?

18. Helen Olson needs an installment loan of \$999.00 to purchase a power washer from a paint store. She must repay the loan in 24 months. The monthly payment is \$44.96. What is the APR of her loan?
19. Brent and Lola Miller are buying a washer that costs \$399.95 and a dryer that costs \$249.99. To use the store's installment plan, they need a down payment of \$49.94. They must make 18 monthly payments of \$37.08 each. What is the APR on their installment loan?
20. Jorge Holland is having a new furnace installed. The furnace costs \$3,500.00. The bank requires a down payment of 20 percent and 36 monthly payments of \$85.18 each. What is the APR on his loan?
21. Ty Chin is buying a new 32-inch television set that costs \$599.99 plus 6 percent sales tax. To use the installment plan available at the electronics store, he must make a down payment of 25 percent and make 30 monthly payments of \$17.00 each. What is the APR on his loan?
22. Chef Andrew Stachowick is buying a gas range. He would like an installment loan of \$5,000 to be repaid in 36 months. Nathaniel Loan Company will grant the loan with a finance charge of \$893.00. City Finance Company will grant the loan with a finance charge of \$935.50. What is the APR on each loan?
23. Wayne Charles is financing the replacement of kitchen cupboards with an installment loan of \$8,000 to be repaid in 24 months. ABC Finance Company will grant the loan with a finance charge of \$881.60. Atco Financial Service will grant the loan with a finance charge of \$904.00. What is the APR on each loan?
24. Eleanor Penny had a \$1,987.00 water softener installed. She made a down payment of \$87.00. She can finance the remainder through the dealer at \$169.00 a month for 12 months. She could also obtain a credit union loan at \$114.19 per month for 18 months. Find the following for each loan: the finance charge, the APR, and the total amount paid. Which payment plan is the best deal? Why?
25. Kathleen Dunn purchased a laptop computer for \$1,200.00. She made a down payment of \$500.00. She can finance the remainder by agreeing to pay \$31.34 per month for 24 months to the computer company. She could also obtain a small business loan at \$40.44 per month for 18 months. Find the following for each loan: the finance charge, the APR, and the total amount paid. Which payment plan is the best deal?

Need Help? Go to...

- Skill 2: Rounding Numbers, page 729
- Skill 10: Dividing (Decimal Remainder), page 737
- Skill 11: Dividing Decimals, page 738

MAINTAINING YOUR SKILLS

Round to the nearest cent.

26. \$19.439

27. \$12.4162

28. \$40.3072

Divide. Round answers to the nearest hundredth.

29. $510 \div 17$

30. $1,060 \div 24$

31. $2,642 \div 47$

SECTION 8-1 **CONCEPT CHECK** (p. 285)

1. \$15, \$615
2. \$20, \$820
3. \$14.79, \$614.79
4. \$19.73, \$819.73

SECTION 8-2 **CONCEPT CHECK** (p. 288)

1. $\$1,999.99 - \$199.99 = \$1,800$
2. $\$3,950 - \$150 = \$3,800$
3. $\$1,360 \times 0.20 = \272 ;
 $\$1,360 - \$272 = \$1,088$
4. $\$725 \times 0.30 = \217.50 ;
 $\$725 - \$217.50 = \$507.50$

SECTION 8-3 **CONCEPT CHECK** (p. 291, 292)

1. Monthly Payment: $(\$1,600.00 \div \$100.00) \times \$4.61 = \73.76
Total Repaid: $24 \times 73.76 = \$1,770.24$
Finance Charge: $\$1,770.24 - \$1,600.00 = \$170.24$
2. Down Payment: $\$4,000.00 - (\$4,000.00 \times 0.20) = \800.00
Amount Financed: $\$4,000.00 - \$800.00 = \$3,200.00$
Monthly Payment: $(\$3,200.00 \div \$100.00) \times \$3.23 = \103.36
Total Repaid: $36 \times 103.36 = \$3,720.96$
Finance Charge: $\$3,720.96 - \$3,200.00 = \$520.96$

SECTION 8-4 **CONCEPT CHECK** (p. 295)

1. \$10.03
2. \$297.05
3. \$1,207.87
4. a. $\$8,000 \times 0.12 \times \frac{1}{12} = \80.00
b. $\$3,222.44 \times 0.12 \times \frac{1}{12} = \32.22

SECTION 8-5 **CONCEPT CHECK** (p. 298)

1. $\$800 \times 0.10 \times \frac{1}{12} = \6.67 ; $\$800 + \$6.67 = \$806.67$
2. $\$816.04 \times 0.12 \times \frac{1}{12} = \8.16 ; $\$816.04 + \$8.16 = \$824.20$
3. $(12 \times \$106.56) - [(4 \times \$106.56) + \$824.20]$
 $= \$1,278.72 - [\$425.24 + \$824.20]$
 $\$1,278.72 - \$1,250.24 = \$28.28$

SECTION 8-6 **CONCEPT CHECK** (p. 301)

1. $\$100 \times \frac{24.64}{800} = \3.08
APR = 10.5%
2. $\$100 \times \frac{96.22}{850} = \11.32
APR = 10.5%
3. Finance charge = $(24 \times \$186) - \$4,000 = \$4,464 - \$4,000 = \$464$
Finance charge per \$100 = $\$100 \times (\$464 \div \$4,000) = \11.60
Row for 24 payments, number closest to \$11.60 is \$11.58.
The APR is 10.75%.

Living in the Real World

A Picture-Perfect Loan

Analyze the Story As Chen found out, dreams do have a price tag attached. Depending on whether or not you're willing to save or get a loan, you'll need to contemplate the type of loan to take out.

Negotiating to Arrive at a Decision What are you willing to take out a loan for?

- Create a list of expensive items that you might need a loan for in the future. Pick one to pursue.
- Use the Internet to find out about your item's expense. Find out how much you'd need to spend in order to get it.
- On a sheet of paper, estimate how long it might take if you took out a loan like Chen was looking at. (See Section 8-4 on page 294.)
- Discuss with classmates if the item is worth taking out a loan and paying interest on over a number of years.
- Put together a pro and con list after openly talking with your friends. Make a decision about purchasing the item in the future.



After YOU READ

REVIEW OF KEY WORDS

single-payment loan (p. 284)

promissory note (p. 284)

maturity value (p. 284)

term (p. 284)

ordinary interest (p. 284)

exact interest (p. 284)

installment loan (p. 287)

annual percentage rate (p. 290)

down payment (p. 287)

amount financed (p. 287)

simple interest installment loan (p. 290)

repayment schedule (p. 294)

final payment (p. 297)

Determine if the following statements are true or false.

- A **loan** is money that you have borrowed and must repay.
- A **single-payment loan** is a loan for which you pay a portion of the loan and a portion of the interest in several installments.
- The total amount of money you repay is called the **maturity value**.
- The **term** of the loan is the amount borrowed.
- Ordinary interest** is calculated by basing the time on a 365-day year.
- The **down payment** is a portion of the cash price of the item you are purchasing.
- The formula for the **amount financed** is the cash price plus the exact interest.
- For a **simple interest installment loan**, you usually repay the amount financed plus the finance charge in equal monthly payments.
- The **annual percentage rate** is interest calculated by basing the time of the loan on a 31-day month.
- A **repayment schedule** shows a plan to distribute interest and principal over the life of the loan.

Skills and Concepts

SECTION OBJECTIVE 8-1 AND EXAMPLES

Compute the maturity value and interest rate of a single-payment loan.

Ricardo Lopez's bank granted him a single-payment loan of \$3,500 for 80 days at 11 percent ordinary interest. What is the maturity value of the loan?

STEP 1: Find the ordinary interest.

$$\begin{aligned} \text{Principal} \times \text{Rate} \times \text{Time} \\ \$3,500 \times 11\% \times \frac{80}{360} \\ = \$85.56 \end{aligned}$$

STEP 2: Find the maturity value.

$$\begin{aligned} \text{Principal} + \text{Interest Owed} \\ \$3,500 + \$85.56 \\ = \$3,585.56 \text{ maturity value} \end{aligned}$$

REVIEW EXERCISES

11. Dee Thomas obtained a single-payment loan of \$21,400 to purchase a diamond necklace and bracelet set. She agreed to repay the loan in 120 days at an ordinary interest rate of 8.5 percent. What is the maturity value of her loan?
12. Bert Burruezo obtained a single-payment loan from University Bank for \$6,000. He agreed to repay the loan in 60 days at an exact interest rate of 6 percent. What is the maturity value of his loan?

	Principal	Interest Rates		Term	Interest	Maturity Value
		Ordinary	Exact			
13.	\$1,540	—	5%	60	a.	b.
14.	2,500	5%	—	72	a.	b.

SECTION OBJECTIVE 8-2 AND EXAMPLES

Calculate the amount financed on an installment loan.

Theresa Traurig is buying a new copy machine for \$635.88. She made a down payment of 15 percent and will finance the remainder. How much did Traurig finance?

STEP 1: Find the down payment.

$$\begin{aligned} \$635.88 \times 15\% \\ = \$95.38 \end{aligned}$$

STEP 2: Find the amount financed.

$$\begin{aligned} \text{Cash Price} - \text{Down Payment} \\ \$635.88 - \$95.38 \\ = \$540.50 \text{ financed} \end{aligned}$$

REVIEW EXERCISES

15. Daleen Aragon purchased a DVD player and speaker system for her home. The total cost of her purchases was \$587.33. Using the store's credit plan, she made a \$147.00 down payment. What amount did she finance?
16. Levi Lemke wants to purchase a car costing \$21,000. He will finance the car with an installment loan from the bank, but he would like to finance no more than \$14,280. What percent of the total cost of the car should his down payment be?

REVIEW EXERCISES (continued)

	Cash Price	Down Payment (Cash)	Down Payment (Percent)	Down Payment (in Dollars)	Amount Financed
17.	\$ 789	\$300	—	a.	b.
18.	4,500	—	25%	a.	b.

SECTION OBJECTIVE 8-3 AND EXAMPLES

Figure out the monthly payment, total amount repaid, and finance charge on an installment loan.

Andria Berger obtained an installment loan of \$2,200 to purchase a fence for her home. The annual percentage rate is 10 percent. She must repay the loan in 24 months. What is the finance charge?

STEP 1: Find the monthly payment. (Refer to the *Monthly Payment on a Simple Interest Installment Loan of \$100* table on page 799.)

$$\frac{\text{Amount of Loan}}{\$100} \times \text{Monthly Payment for a \$100 loan} = \text{Monthly Payment}$$

$$\frac{\$2,200.00}{\$100.00} \times \$4.61 = \$101.42$$

STEP 2: Find the total amount repaid.

$$\text{Number of Payments} \times \text{Monthly Payment} = \text{Total Amount Repaid}$$

$$24 \times \$101.42 = \$2,434.08$$

STEP 3: Find the finance charge.

$$\text{Total Amount Repaid} - \text{Amount Financed} = \text{Finance Charge}$$

$$\$2,434.08 - \$2,200.00 = \$234.08 \text{ finance charge}$$

REVIEW EXERCISES

For these problems, you might need to refer to the *Monthly Payment on a Simple Interest Installment Loan of \$100* table on page 799.

19. James Proctor obtained an installment loan of \$3,500 to have some trees removed from his yard. The APR is 12 percent. The loan is to be repaid in 30 months. What is the finance charge?

20. Rick and Annette Evans purchased a new living room set at Allied Furniture Store for \$2,896.00. They agreed to make a down payment of 20 percent and finance the remainder for 12 monthly payments. The APR is 8 percent. What is the finance charge?

	APR	Term (Months)	Table Value	Amount Financed	Monthly Payment	Total Repaid	Finance Charge
21.	8%	6	a.	\$1,500	b.	c.	d.
22.	10%	6	a.	2,300	b.	c.	d.

SECTION OBJECTIVE 8-4 AND EXAMPLES

Work out the payment to interest, payment to principal, and the new balance.

Jorge Ortega obtained a loan of \$2,800.00 at 8 percent for 1 year. The monthly payment was \$243.60. For the first payment, what is the interest? What is the payment to principal? What is the new principal?

STEP 1: Find the interest.

Principal \times **Rate** \times **Time**

$$\$2,800.00 \times 8\% \times \frac{1}{12} = \$18.67 \text{ interest}$$

STEP 2: Find the payment to principal.

Monthly Payment $-$ **Interest**

$$\$243.60 - \$18.67 = \$224.93 \text{ payment to principal}$$

STEP 3: Find the new principal.

Previous Principal $-$ **Payment to Principal**

$$\$2,800.00 - \$224.93 = \$2,575.07 \text{ new principal}$$

REVIEW EXERCISES

	Loan Balance	Interest Rate	Monthly Payment	Amount for Interest	Amount for Principal	New Principal
23.	\$3,900	12%	\$303.55	a.	b.	c.
24.	1,800	9%	114.48	a.	b.	c.
25.	1,300	8%	105.43	a.	b.	c.
26.	2,600	10%	189.45	a.	b.	c.

27. Daniel Orrange obtained an installment loan of \$8,500 at 14 percent for 42 months. The balance of the loan after 26 payments is \$3,733.55. What is the interest for payment 27?

28. Bill Nanz obtained a loan for porch furniture. The loan is for \$2,500 at 12.5 percent. The monthly payment is \$118.23. What is the interest for the first payment? What is the payment to principal? What is the new principal?

SECTION OBJECTIVE 8-5 AND EXAMPLES

Compute the final payment when paying off a simple interest installment loan.

You have a 6-month loan of \$1,000.00 at 10 percent with a balance of \$338.89 after payment 4. What is the final payment if you pay off the loan with payment 5?

STEP 1: Find the previous balance.

$$= \$338.89$$

STEP 2: Find the interest for the fifth month.

Principal \times Rate \times Time

$$\$338.89 \times 10\% \times \frac{1}{12} = \$2.82$$

STEP 3: Find the final payment.

Previous Balance + Current Month's Interest

$$\$338.89 + \$2.82 = \$341.71 \text{ final payment}$$

REVIEW EXERCISES

	Interest Rate	Previous Balance	Interest	Final Payment
29.	10%	\$3,600.00	a.	b.
30.	8%	2,400.00	a.	b.
31.	12%	4,860.80	a.	b.
32.	6%	2,984.50	a.	b.

SECTION OBJECTIVE 8-6 AND EXAMPLES

Use a table to find the annual percentage rate of a loan.

Paula Simms obtained an installment loan of \$900.00 to purchase a digital camera to use at work. The finance charge is \$13.14. She agreed to repay the loan in 6 months. What is the annual percentage rate?

STEP 1: Find the finance charge per \$100.

$$\$100 \times \frac{\text{Finance Charge}}{\text{Amount Financed}}$$

$$\$100 \times \frac{\$13.14}{\$900.00}$$

$$\$100 \times 0.0146 = \$1.46$$

STEP 2: Find the APR. (Refer to the Annual Percentage Rate for Monthly Payment Plans table on pages 794–795.)

In the row for 6 payments, find the number closest to \$1.46. It is \$1.46. Read the APR at the top of the column. **APR is 5.00 percent.**

REVIEW EXERCISES

For Problems 33–36, refer to the Annual Percentage Rate for Monthly Payment Plans table on pages 794–795.

	Finance Charge	Amount Financed	Finance Charge per \$100	Number of Payments	Annual Percentage Rate
33.	\$ 45.20	\$2,000	a.	6	b.
34.	84.24	3,600	a.	12	b.
35.	160.00	2,500	a.	18	b.
36.	81.00	4,500	a.	18	b.

Cumulative Test Prep



Test-Taking Tip

On most tests you can get as much credit for correctly answering the easy questions as you do for correctly answering the difficult ones. Answer the easy questions first and then spend time on the more challenging questions.

SECTION ONE: MULTIPLE CHOICE

This section contains six multiple-choice questions. After working each problem, write the letter of the correct answer on your paper.

- Alma Ying used her bank charge card to purchase a sound system. The system cost \$995.99 plus 6 percent sales tax. What was the total purchase price on the sales receipt?
 - (A) \$59.76
 - (B) \$936.23
 - (C) \$1,055.75
 - (D) \$1,055.76
- Find the new balance on the charge account statement.

Previous Balance	Closing Date This Month	Closing Date Last Month		
\$175.41	November 13, 20--	October 14, 20--		
Total Purchases	Payments & Credits	Finance Charge	New Balance	Minimum Payment
\$72.59	\$50.00	\$1.90		—

- (A) \$150.92
 - (B) \$154.72
 - (C) \$199.90
 - (D) \$299.99
- Tom DuVall obtained a 36-month loan of \$4,350 for a used car. The interest rate is 8 percent. His monthly payment is \$124.62. What is the payment to principal for the first payment?
 - (A) \$95.56
 - (B) \$95.57
 - (C) \$95.62
 - (D) \$95.75

- Charles Quick's bank granted him a single-payment loan of \$3,240 for 100 days at an exact interest rate of 6 percent. What is the maturity value of his loan?
 - (A) \$53.26
 - (B) \$54.00
 - (C) \$3,293.26
 - (D) \$3,294.00
- Valerie Beecher purchased a car for \$4,000. She will finance the car with an installment loan from the bank but would like to finance no more than \$2,500. What percent of the total cost of the car should her down payment be?
 - (A) 25 percent
 - (B) 35 percent
 - (C) 37.5 percent
 - (D) 40.5 percent
- Lisa Snow obtained an installment loan of \$2,300. The annual percentage rate is 18 percent. She plans to repay the loan in 24 months. (Use the table to find the finance charge.) What is the monthly payment?

Monthly Payment on a \$100 Loan

Term in Months	Annual Percentage Rate			
	15.00%	16.00%	17.00%	18.00%
6	17.40	17.45	17.50	17.55
12	9.03	9.07	9.12	9.17
18	6.24	6.29	6.33	6.38
24	4.85	4.90	4.94	4.99
30	4.02	4.07	4.11	4.16

- (A) \$114.77
- (B) \$454.48
- (C) \$507.63
- (D) \$2,754.48

SECTION TWO: FREE RESPONSE

This section contains four questions for which you will supply short answers. Write your answer on your paper.

- Rocky Butler obtained a 12-month loan of \$1,540.00. The interest rate is 12 percent. His monthly payment is \$136.75. For the first payment, what is the interest? What is the payment to principal? What is the new principal?
- Linda Hartman took out a simple interest loan of \$3,600.00 at 18 percent for 12 months. After 9 payments, the balance is \$960.48. She pays off the loan when the next payment is due. What is the interest? What is the final payment?
- Juan Corvez obtained an installment loan of \$625.00 to pay for a new stove. The finance charge is \$102.44. He agreed

to make 24 payments of \$30.31 each. Find the annual percentage rate.

(Use this table.)

Finance Charge per \$100 Financed			
Number of Payments	APR		
	14.50%	14.75%	15.00%
6	\$ 4.27	\$ 4.35	\$ 4.42
12	8.03	8.17	8.31
18	11.87	12.08	12.29
24	15.80	16.08	16.37

- Jane Tripp had a previous balance of \$4,532.66 on an installment loan through her bank. The interest rate is 4 percent. What is the interest for the next payment? What is the final payment if she decides to pay off the loan as she makes this payment?

SECTION THREE: OPEN-ENDED

This section contains four open-ended questions. Demonstrate your knowledge by giving a clear, concise solution to each problem. Your score on these problems will depend on how well you do on the following:

- Explain your reasoning.
 - Show your understanding of mathematics in an organized manner.
 - Use charts, graphs, and diagrams in your explanation.
 - Show the solution in more than one way or relate it to other situations.
 - Investigate beyond the requirements of the problem.
- Why should you review your charge account statement when you receive it? What should you look for?
 - Create a sample problem and compute the finance charge using the average-daily-balance method (with no new

purchases) and the unpaid-balance method. Which one is less expensive to the consumer?

- The use of credit is widespread. Some people use credit cards and take out loans for emergencies only. Others believe credit is necessary for everyday living. Explain your position.
- Explain how can you use the APR of loans to compare the relative cost of borrowing money.

Mathematics Online

To learn more about loans, visit busmath.glencoe.com.