8-1 Maturity Value and Interest Rate of Single-Payment Loan

A loan that you repay with one single payment at the end of a specified period of time is called a **single-payment loan.** The **maturity value** of a loan is the total amount you must repay, including the principal and any interest you incur. The **term** of the loan is the time for which it has been granted. When the term is a certain number of days, interest can be computed two ways: **ordinary interest** based on a 360-day year, or **exact interest** based on a 365-day year.

Ordinary Interest = Principal × Rate × Time ÷ 360
Exact Interest = Principal × Rate × Time ÷ 365
Maturity Value = Principal + Interest Owed

Example

Find the maturity value.

Lucia Alunnio's bank granted her a single-payment loan of $5,000 for 100 days at 6.5 percent exact interest. What is the maturity value of the loan?

1. Find the exact interest.
   Exact Interest = Principal × Rate × Time ÷ 365
   $5,000 × 0.065 × 100 ÷ 365 = $89.04 exact interest

2. Find the maturity value.
   Maturity Value = Principal + Interest Owed
   $5,000 + $89.04 = **$5,089.04 maturity value**

Practice

Find the interest and the maturity value.

	Principal	Interest Rate Ordinary	Interest Rate Exact	Term	Interest	Maturity Value
1.	$ 750	5.00%	—	35	a.	b.
2.	1,250	—	7.00%	60	a.	b.
3.	2,758	5.75%	—	75	a.	b.
4.	9,129	—	6.25%	120	a.	b.

5. Amy Brownwen's bank granted her a $10,000 single-payment loan for 200 days at 7 percent ordinary interest. At the end of the loan term, how much interest will she owe?

6. Sunita Wuz's bank agreed to lend her $7,800 for 150 days at a 7.5 percent exact interest rate. If this is a single-payment loan, how much interest will she owe?

7. Alexander Ajendro borrowed $3,200. The bank granted him a single-payment loan of $3,200 for 92 days at an ordinary interest rate of 8 percent. What is the maturity value of his loan?

8. **Standardized Test Practice** Marcus Dobson wants to purchase new computers for his office staff. The bank grants him a single-payment loan of $22,000 for 182 days at 7.75 percent exact interest. What is the maturity value of his loan?
   A. $861.97   **B.** $850.16   **C.** $22,861.97   **D.** $22,850.16

Calculating the Amount Financed on an Installment Loan

8-2

A loan that you repay with several equal payments over a specified period of time is called an **installment loan.** This type of loan usually requires a **down payment,** which is a cash portion of the price paid at the time of purchase. The **amount financed** is the amount you owe *after* making the down payment.

Example

Find the amount financed.

Lucia Alunnio purchased a new computer for $1,329 by taking advantage of the store's installment credit plan. If Alunnio made a 25 percent down payment and financed the remainder, what is the amount she financed?

1. Find the down payment.
   Down Payment = Amount ×Percentage
   $1,329 × 0.25 = $332.25

2. Find the amount financed.
   Amount Financed = Cash Price − Down Payment
   $1,329 − $332.25 = **$996.75 amount financed**

Practice

Find the down payment and amount financed.

	Cash Price	Down Payment (Cash)	(Percent)	Amount Financed
1.	$5,200	$1,560	a.	b.
2.	8,270	$1,654	a.	b.
3.	4,800	a.	20%	b.
4.	9,254	a.	35%	b.

5. Amy Brownwen would like to add a $10,000 sunroom to her home. She finances the addition through her bank, making a 20 percent down payment and paying the rest through the bank's installment plan. What amount does Brownwen finance?

6. Sunita Wuz wants to renovate her home. The bank agreed to lend her $7,800. The bank requires a 15 percent down payment and will allow the rest to be paid off on its installment plan. What is the amount of Wuz's down payment?

7. Alexander Ajendro wants to have a new well put in on his country property. The bank granted him a loan of $3,200, requiring a 25 percent down payment. What amount does Ajendro finance?

8. **Standardized Test Practice** Marcus Dobson wants to purchase new computers for his office staff. The bank grants him a loan for $22,000, requiring a down payment of 20 percent. What amount does Dobson finance?

   A. $4,400   **B.** $17,600   **C.** $26,400   **D.** $39,600

8-3 Simple Interest Installment Loans

A **simple interest installment loan** requires you to pay finance charges for use of the money you borrow. The loan is repaid in equal monthly installments, which are used to pay the interest on the unpaid portion of your balance. The remaining portion is used to reduce your balance. The amount of each monthly payment depends on the amount financed, the number of payments, and the **annual percentage rate** (APR), an index showing the relative cost of borrowing money.

Example

Find the finance charge.

Lucia Alunnio received an installment loan for $1,329. The annual percentage rate is 10 percent. She must repay the loan in 12 months. What is the finance charge on the loan? Use the Monthly Payment on a $100 Loan table on page 177 to solve the problem.

1. Find the monthly payment.

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

($1,329 ÷ $100) × $8.79 = $116.82 monthly payment

2. Find the total amount repaid.
   Total Amount Repaid = Number of Payments × Monthly Payment
   12 × $116.82 = $1,401.84 total amount repaid

3. **Finance Charge = Total Amount Repaid − Amount Financed**
   $1,401.84 − $1,329 = **$72.84 finance charge**

Practice

Use the Monthly Payment on a $100 Loan table on page 177 to solve the problems.

	APR	Term (months)	Table Value	Amount Financed	Monthly Payment	Total Repaid	Finance Charge
1.	8%	12	a.	$ 1,500	b.	c.	d.
2.	10%	24	a.	3,200	b.	c.	d.
3.	12%	36	a.	7,850	b.	c.	d.
4.	9%	48	a.	12,175	b.	c.	d.

5. Amy Brownwen received an installment loan of $10,000. The APR is 12 percent and the loan is to be repaid in 48 monthly installments. What is the finance charge on the loan?

6. Sunita Wuz received an installment loan in the amount of $7,800. The APR is 10 percent and the loan is to be paid off over 30 monthly installments. What is the total amount Wuz will have to repay?

7. **Standardized Test Practice** The bank grants Marcus Dobson a loan for $22,000 with an APR of 10 percent. He agrees to a down payment of 20 percent and will repay the loan over 24 months. What amount will Dobson have to repay?

   A. $24,340.80   **B.** $17,600   **C.** $19,472.64   **D.** $1,872.64

Installment Loans—
8-4 **Allocation of Monthly Payment**

When you repay a simple interest installment loan, the amount of principal you owe *decreases* with each monthly payment. A **repayment schedule** shows the distribution of interest and principal over the life of the loan.

Example

Find the interest, the payment to principal, and the new principal.

Lucia Alunnio received an installment loan for $1,329 to purchase a new computer. The annual percentage rate is 7.5 percent and the monthly payment is $116.82. Show the calculation for the first month.
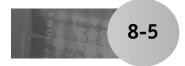
1. **Interest = Principal × Rate × Time**
   $1,329 × 0.075 × \frac{1}{12}$ = **$8.31 interest**

2. **Payment to Principal = Monthly Payment − Interest Payment**
   $116.82 − $8.31 = **$108.51 payment to principal**

3. **New Principal = Previous Principal − Payment to Principal**
   $1,329 − $108.51 = **$1,220.49 new principal**

Practice

Find the interest, the amount for principal, and the new principal.

	Loan Balance	Interest Rate	Monthly Payment	Amount for Interest	Amount for Principal	New Principal
1.	$ 2,750	8%	$239.25	a.	b.	c.
2.	4,154	12%	195.65	a.	b.	c.
3.	8,221	9%	375.70	a.	b.	c.
4.	11,542	11%	442.06	a.	b.	c.

5. To add a $10,000 sunroom to her home, Amy Brownwen received a 48-month loan at 10 percent. Her monthly payment is $254. What are the interest and payment to principal for the first payment?

6. Sunita Wuz wants to renovate her home. The bank agreed to lend her $7,800 at 12 percent for 36 months. If her monthly payment is $258.96, what is the new balance after the first payment?

7. Alexander Ajendro borrowed $2,400 to put a new well on his country property. The interest rate is 12 percent for 12 months. The monthly payment is $213.12. The balance of the loan after four payments is $1,632.10. What is the interest for the fifth payment?

8. **Standardized Test Practice** Leo Gandolfi takes out a short-term loan of $1,800 at 12 percent for 6 months. The monthly payment is $310.50. The balance of the loan after three payments is $913.70. What is the interest for the fourth payment?
   A. $18.00   **B.** $9.14   **C.** $292.50   **D.** $301.36

8-5 Paying Off Simple Interest Installment Loans

When you pay off a simple interest installment loan before the end of the term, you pay the previous month's balance plus the current month's interest. This is the **final payment.** An advantage to paying off the loan early is that you save in interest charges.

Interest = Principal × Rate × Time
Final Payment = Previous Balance + Current Month's Interest
Interest Saved = Total Payback − (Value of Previous Payments + Final Payment)

Example

Find the final payment if the load is paid off in the fifth month.

Repayment Schedule for an $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
4	310.50	9.14	301.36	612.34

1. Find the interest for the current period.
   Interest = Principal × Rate × Time
   $612.34 \times 0.12 \times \frac{1}{12} =$ **$6.12 interest**

2. Find the final payment.
   Final Payment = Previous Balance + Current Month's Interest
   $612.34 + $6.12 =$ **$618.46 final payment**

Practice

Find the interest and the final payment.

	Interest Rate	Previous Balance	Interest	Final Payment
1.	12.0%	$ 964.00	a.	b.
2.	8.0%	1,527.00	a.	b.
3.	9.0%	1,871.40	a.	b.
4.	10.0%	2,355.72	a.	b.

5. **Standardized Test Practice** Leo Gandolfi takes out a short-term loan of $1,800 at 12 percent for 6 months. The monthly payment is $310.50. The balance of the loan after 4 payments is $612.34. How much does he save by paying off the loan when the next payment is due?
   A. $6.12   **B.** $18.00   **C.** $2.54   **D.** $618.46

8-6 Using Tables to Find the APR of a Loan

You can use tables to determine the APR of a loan if you know the number of monthly payments and the finance charge per $100 of the amount financed. Knowing the APR allows you to compare the relative cost of borrowing money.

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

Example

Use a table to find the annual percentage rate.

Lucia Alunnio received an installment loan of $1,329 to purchase a new computer. The finance charge is $80.54. She agreed to repay the loan in 12 monthly installments. What is the annual percentage rate?

1. Find the finance charge per $100.
   $100 × (Finance Charge ÷ Amount Financed)
   $100 × ($80.54 ÷ $1,329) = $6.06 finance charge per $100

2. Find the APR using the Annual Percentage Rate for Monthly Payment Plans table on page 177.
   APR = **11%**

Practice

Find the finance charge per $100 and the APR. Use the Annual Percentage Rate for Monthly Payment Plans table on page 177 to find the APR.

	Finance Charge	Amount Financed	Finance Charge per $100	Number of Payments	APR
1.	$110.00	$2,000	a.	12	b.
2.	82.75	2,500	a.	6	b.
3.	590.59	4,550	a.	24	b.
4.	572.69	6,125	a.	18	b.

For Problems 5 and 6, find the APR.

5. The amount of the installment loan is $7,800. The finance charge is $903.24. There are 24 monthly installments.
6. The amount of the installment loan is $10,000. The finance charge is $977. There are 18 monthly installments.
7. Alexander Ajendro received an installment loan for $3,200 to put a new well on his country property. The finance charge is $216.32. He agreed to pay off the loan in 12 monthly installments. What is the APR?
8. **Standardized Test Practice** Leo Gandolfi takes out a short-term installment loan of $1,800 for 6 months. The finance charge is $54.18. What is the APR?
   A. 10%   **B.** 10.25%   **C.** 10.5%   **D.** 11%

8 Chapter Review

Loans—Fill-in-the-Blank

1. _____ interest is based on a 360-day year.

2. Total Amount Repaid − Amount Financed = _____ charge.

3. A loan you repay with several equal payments over a specified period of time is called a(n) _____ loan.

4. The amount you must repay on a loan, including interest and principal is its _____ value.

5. APR = annual _____ rate.

6. A(n) _____ schedule shows the distribution of interest and principal over the life of a loan.

7. An upfront cash portion of the purchase price is a(n) _____.

8. Final Payment = Previous Balance + Current Month's _____.

9. A loan you repay with one payment at the end of a specified period of time is a(n) _____ loan.

10. Maturity Value = _____ + Interest Owed.

11. The _____ of a loan is the time for which it has been granted.

12. _____ interest is based on a 365-day year.