Applications

Lend money to an enemy, and thou will gain him, to a friend, and thou will lose him.

—Benjamin Franklin, American statesman and inventor

1. Interpret the quote in the context of what you learned about loans in this section and on your experiences or expectations. See margin.
2. Arrange the following lending institutions in descending order according to their APRs for a $10,000, 2-year loan. Columbia, East Meadow, First Bank, Tivoli, Clinton Park

East Meadow Savings	$4\frac{1}{2}\%$
Clinton Park Credit Union	4%
Tivoli Trust	$4\frac{3}{8}\%$
First Bank of Rhinecliff	4.45%
Columbia Consumer Finance Corp.	$4\frac{9}{16}\%$

3. How many more monthly payments are made for a 5-year loan than for a 2-year loan? 36
4. How many monthly payments must be made for a 2½-year loan? 30
5. Bart needs to borrow $7,000 from a local bank. He uses the table of monthly payments on page 159 to compare the monthly payments for a 3% loan for three different periods of time.
   a. What is the monthly payment for a 2-year loan? $300.86
   b. What is the monthly payment for a 3-year loan? $203.56
   c. What is the monthly payment for a 5-year loan? $125.79
6. Darnelle has a $10,000, 3-year loan with an APR of 5%. She uses the table on page 159 to compute information on the loan.
   a. What is her monthly payment? $299.70
   b. What is the total of all her monthly payments? $10,789.20
   c. What is the finance charge? $789.20
7. Melissa wants to check the accuracy of the finance charge on her promissory note. She has a $6,000, 4-year loan at an APR of 3.11%. Round to the nearest cent.
   a. What is her monthly payment? Round to the nearest cent. $133.10
   b. What is the total of all her monthly payments? $6,388.80
   c. What is the finance charge? $388.80
8. The policy of the Broadway Pawnshop is to lend up to 35% of the value of a borrower's collateral. John wants to use a $3,000 ring and a $1,200 necklace as collateral for a loan. What is the maximum amount that he could borrow from Broadway? $1,470
9. Jordan is taking out a 2-week payday loan for $600. He will be charged $95 interest for the 2-week loan. What is the APR for this loan? 413%
10. Juliana is taking out an $8,700, 3-year loan with an APR of 2.31%. What will be the monthly payment for this loan? Round to the nearest cent. $250.37

TEACH

For exercises involving monthly payments, students should be provided with the formula for these exercises.

On tests, you can give them an option—to take a test with or without the formula sheet. You can offer bonus points for students who elect to memorize the formulas.

Exercise 4

This exercise requires students to use the number of months as a fraction of a year. Extra practice can be given at the board.

Exercise 5

This is a typical analysis most borrowers do so they can choose the term of a loan. The advantage to a long period is a low monthly payment. The disadvantage is more total interest.

Exercise 7

Point out to the students that, equipped with their monthly payment formula, they can check to ensure the bank is doing the calculations on their loans correctly.

ANSWERS

1. Borrowing money from a friend can create problems. Friends can take advantage of one another since repayment is not structured with a legal contract.

11. Lavonda took out a $7,500 loan with an APR of 3.875% and agreed to pay it back monthly over 6 years. How many monthly payments did she make? 72

12. Solomon is taking out a $15,320, 2-year loan with an APR of 3.29%. What will be the finance charge for this loan to the nearest dollar? $531

13. Reggie needs a quick x-dollar loan until his next payday in 2 weeks to take advantage of a sale on ski equipment. The bank would take too long on the paperwork, so he goes to a pawnshop. The pawnshop will only lend him 25% of the value of his collateral. Express algebraically the amount of collateral Reggie must use for this loan. $4x$

14. Olivia is considering membership to the Regional Teachers' Credit Union so that she can save money on a loan. The credit union will lend her $8,000 for 3 years at 2.25% APR. The same loan at her savings bank has an APR of 2.9%. How much would Olivia save in finance charges if she joined the credit union and took out her loan there? Round to the nearest ten dollars. $80

15. Rob wants to purchase a $5,000 drum set. The music store offers him a 2-year installment agreement requiring $800 down and monthly payments of $202.50. Rob has a poor credit rating.
    a. What is his interest on this installment agreement? $660
    b. Instead of using the store's installment plan, Rob can borrow $5,000 at an APR of 7% from a local consumer finance company. What would be the monthly payment for this loan using the table from Example 1? Round to the nearest cent. $223.85
    c. How much interest would the finance company charge? $372.40
    d. Should Rob use the installment plan or borrow the money from the finance company? Finance company.

16. Lee wanted to compute the monthly payment on a 2-year, $8,400 loan at an APR of 3.07%. She entered the keystrokes at the right on her calculator. The display gives an answer of 48, which Lee knows is incorrect. Explain what her error was. See margin.

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8400(0.0307/12)(1+0.0307/12)^24/(1+0.0307/12)^24-1
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17. A loan used for buying a home is called a *mortgage*. The Fortunato family is borrowing $430,000 to buy a home. They are taking out a 30-year mortgage at a rate of 3.55%.
    a. Compute the monthly payment to the nearest cent. $1,942.91
    b. Find the total of all of the monthly payments for 30 years. $699,447.60
    c. What is the total interest? $269,447.60
    d. Which is greater, the interest or the original cost of the home? Home

18. The following spreadsheet can be used to compute monthly payments given the APR, principal, and term of the loan.

	A	B	C	D	E
1	**Principal in Dollars**	**Interest Rate as a Decimal**	**Time in Years**	**Time in Months**	**Monthly Payment**
2	11,000	0.03	4	**c.**	**f.**
3	900	0.027	0.5	**d.**	**g.**
4	2,500	0.034	2	**e.**	**h.**

    a. Write the spreadsheet formula to compute cell D2. =12*C2
    b. Write the spreadsheet formula to compute cell E2. See margin.
    c–h. Use your spreadsheet to fill in the missing entries. See margin.

TEACH

Exercise 16

This exercise demonstrates the need to use parentheses carefully, and why students need to use number sense when reviewing their answers.

ANSWERS

16. The parentheses that group the entire numerator and the parentheses that group the entire denominator were omitted.

17. The mortgage amount is $430,000, after any down payment.

18b. =(A2*(B2/12)
(1+B2/12)^D2)/
((1+B2/12)^D2−1)
c. 48
d. 6
e. 24
f. $243.48
g. $151.18
h. $107.90