

$$\begin{aligned}
 PMT &= FV \cdot \frac{\left(\frac{r}{n}\right)}{\left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]} \\
 &= 750,000 \cdot \frac{\left(\frac{0.08}{12}\right)}{\left[\left(1 + \frac{0.08}{12}\right)^{12 \cdot 45} - 1\right]} \\
 &\approx 142.19
 \end{aligned}$$

Skill Check Answers

1. \$34,931.95
2. \$16,359.26
3. \$1,242,475.47

So, if you wish to retire and make \$60,000 per year without affecting the principal in your retirement fund, you need to start at age 22 depositing approximately \$143 per month. With a fixed APR of 8% over the years of your retirement, you will never outlive your retirement savings.

5.3 EXERCISES

 PRACTICE

For each situation, use the formula for present value of money to calculate the amount you need to invest now in one lump sum to reach the amount given. Round your answer to the nearest cent, if necessary.

1. \$25,000 after 10 years with an APR of 8% compounded monthly
2. \$25,000 after 10 years with an APR of 12% compounded monthly
3. \$100,000 after 18 years with an APR of 6% compounded quarterly
4. \$1,000,000 after 40 years with an APR of 10% compounded monthly

 APPLICATIONS

5. Alexis and Will are purchasing a home. They wish to save money for 10 years and purchase a house that has a value of \$180,000 with cash. If they deposit money into an account paying 12% interest, how much do they need to deposit each month in order to make the purchase?
6. Marilyn wishes to retire at age 65 with \$2,000,000 in the bank. At the age of 21, she decides to begin depositing money into an account with an APR of 11%. What is the monthly payment Marilyn must make in order to make this happen?
7. Repeat Exercise 6 with an APR of 6%.

8. Repeat Exercise 6 with a desired retirement amount of \$1,500,000.
9. Suppose you wish to retire at the age of 65 with \$80,000 in savings. Determine your monthly payment into an IRA (Individual Retirement Account) if the APR is 7.5% and you begin making payments at
- 20 years old.
 - 30 years old.
 - 40 years old.
10. Revere College predicts that in 18 years it will take \$200,000 to attend the college for four years. Debbie wishes to save money for her child's college fund. How much should Debbie put aside in an account with an APR of 9% compounded monthly in order to have \$200,000 in the account in 18 years?
11. Repeat Exercise 10 with an interest rate earned of 5%.
12. Repeat Exercise 10 with an interest rate earned of 3.5%.
13. Suppose you'd like to save enough money to pay cash for your next car. The goal is to save an extra \$26,000 over the next 6 years. What amount of quarterly payments must you make into an account that earns 5.5% interest in order to reach your goal?
14. Repeat Exercise 13 if the interest rate earned is 6.5%.
15. Repeat Exercise 13 if the interest rate earned is 3.5%.
16. Willie deposits a fixed monthly amount into an annuity account for his child's college fund. He wishes to accumulate a future value of \$75,000 in 15 years.
- Assuming an APR of 3.5%, how much money should Willie deposit monthly in order to reach his goal?
 - How much of the \$75,000 will Willie ultimately deposit in the account, and how much is interest earned?
17. Repeat Exercise 16 with an APR of 6%.
18. Repeat Exercise 16 with an accumulated amount of \$125,000.
19. Blake starts an IRA (Individual Retirement Account) to save for retirement at the age of 22. He deposits \$450 each month. The IRA has an average annual interest rate of 7%.
- How much money will he have saved upon retirement at the age of 65?
 - Determine the amount of money Blake deposited over the length of the investment and how much he made in interest.
20. Jimmie has a job at an advertising agency earning \$54,000 per year. Jimmie is currently 26 years old and wishes to retire at age 67 with a retirement income of \$75,000. How much money would Jimmie need to invest each month into a growth stock mutual fund with an interest rate of 6.5% in order to withdraw \$75,000 per year without reducing the principal?