

five periods at 10 percent, go to Appendix C for $n = 6$ and $i = 10$ percent. Look up the value of 7.716 and subtract 1 from it for an answer of 6.716 or \$671.60 ($\100×6.716).

What is the future value of a 10-year annuity of \$2,000 per period where payments come at the beginning of each period? The interest rate is 8 percent.

28. Related to the discussion in problem 27, what is the present value of a 10-year annuity of \$3,000 per period in which payments come at the beginning of each period? The interest rate is 12 percent.

Annuity due
(LO4)

Advanced Problems

29. Your grandfather has offered you a choice of one of the three following alternatives: \$5,000 now; \$1,000 a year for eight years; or \$12,000 at the end of eight years. Assuming you could earn 11 percent annually, which alternative should you choose? If you could earn 12 percent annually, would you still choose the same alternative?
30. You need \$23,956 at the end of nine years, and your only investment outlet is a 7 percent long-term certificate of deposit (compounded annually). With the certificate of deposit, you make an initial investment at the beginning of the first year.
- What single payment could be made at the beginning of the first year to achieve this objective?
 - What amount could you pay at the end of each year annually for nine years to achieve this same objective?
31. Beverly Hills started a paper route on January 1, 2004. Every three months, she deposits \$300 in her bank account, which earns 8 percent annually but is compounded quarterly. On December 31, 2007, she used the entire balance in her bank account to invest in an investment at 12 percent annually. How much will she have on December 31, 2010?
32. Franklin Templeton has just invested \$8,760 for his son (age one). This money will be used for his son's education 17 years from now. He calculates that he will need \$60,000 by the time the boy goes to school. What rate of return will Mr. Templeton need in order to achieve this goal?
33. On January 1, 2008, Mr. Dow bought 100 shares of stock at \$12 per share. On December 31, 2010, he sold the stock for \$18 per share. What is his annual rate of return? Interpolate to find the answer.
34. C. D. Rom has just given an insurance company \$30,000. In return, he will receive an annuity of \$3,200 for 20 years.
- At what rate of return must the insurance company invest this \$30,000 in order to make the annual payments? Interpolate.
35. Alex Bell has just retired from the telephone company. His total pension funds have an accumulated value of \$200,000, and his life expectancy is 16 more years. His pension fund manager assumes he can earn a 12 percent return on his assets.



Present value
alternative
(LO3)



Payments required
(LO4)

Quarterly
compounding
(LO5)

Yield
(LO4)

Yield with
interpolation
(LO4)

Yield with
interpolation
(LO4)

Solving for an
annuity
(LO4)

What will be his yearly annuity for the next 16 years?