

12. For the data in Example 3.9, fill the last row of the table when, instead of 30, (a) 20, (b) 40 futures contracts are shorted.
13. Work out the last column in the table of Example 3.9 again when the quantities  $\beta$ ,  $P$ ,  $A$ ,  $F_0$ ,  $S_0$ ,  $F_3$ ,  $S_3$ , and  $r_F$  are unknown.
14. A company has a \$20 million portfolio with a beta of 1.2. It would like to use futures contracts on the S&P 500 to hedge its risk. The index is currently standing at 1080, and each contract is for delivery of \$250 times the index. What is the hedge that minimizes risk?
15. What initial investment subject to annual compounding at 11% is needed to produce \$1,000 after two years?
16. How much can you borrow if the interest rate is 16%, you can afford to pay \$10,000 at the end of each year, and you want to clear the loan in 10 years?
17. What will be the difference between the value after one year of \$100 deposited at 10% compounded monthly and compounded continuously? How frequent should the periodic compounding be for the difference to be less than \$0.02?
18. An interest rate is quoted as 5% per annum with semiannual compounding. What is the equivalent rate with (a) annual, (b) monthly, and (c) continuous compounding?
19. Express the present value of a perpetuity consisting of bimonthly payments of an amount  $C$  in terms of the effective rate.