9. **Calculating Returns and Variability** You've observed the following returns on Mary Ann Data Corporation's stock over the past five years: 27 percent, 13 percent, 18 percent, −14 percent, and 9 percent.
   a. What was the arithmetic average return on Mary Ann's stock over this five-year period?
   b. What was the variance of Mary Ann's returns over this period? The standard deviation?

10. **Calculating Real Returns and Risk Premiums** In Problem 9, suppose the average inflation rate over this period was 4.2 percent, and the average T-bill rate over the period was 5.1 percent.
   a. What was the average real return on Mary Ann's stock?
   b. What was the average nominal risk premium on Mary Ann's stock?

11. **Calculating Real Rates** Given the information in Problem 10, what was the average real risk-free rate over this time period? What was the average real risk premium?

12. **Holding Period Return** A stock has had returns of 16.12 percent, 12.11 percent, 5.83 percent, 26.14 percent, and −13.19 percent over the past five years, respectively. What was the holding period return for the stock?

21. **Arithmetic and Geometric Returns** A stock has had the following year-end prices and dividends:

| Year | Price | Dividend |
|---|---|---|
| 1 | $61.18 | — |
| 2 | 64.83 | $ .72 |
| 3 | 72.18 | .78 |
| 4 | 63.12 | .86 |
| 5 | 69.27 | .95 |
| 6 | 76.93 | 1.08 |

What are the arithmetic and geometric returns for the stock?

22. **Calculating Returns** Refer to Table 10.1 in the text and look at the period from 1973 through 1980.
   a. Calculate the average return for Treasury bills and the average annual inflation rate (consumer price index) for this period.
   b. Calculate the standard deviation of Treasury bill returns and inflation over this period.
   c. Calculate the real return for each year. What is the average real return for Treasury bills?
   d. Many people consider Treasury bills to be risk-free. What do these calculations tell you about the potential risks of Treasury bills?

23. **Calculating Investment Returns** You bought one of Bergen Manufacturing Co.'s 7 percent coupon bonds one year ago for $1,080.50. These bonds make annual payments and mature six years from now. Suppose you decide to sell your bonds today when the required return on the bonds is 5.5 percent. If the inflation rate was 3.2 percent over the past year, what would be your total real return on the investment?

**24. Using Return Distributions** Suppose the returns on long-term government bonds are normally distributed. Based on the historical record, what is the approximate probability that your return on these bonds will be less than −3.7 percent in a given year? What range of returns would you expect to see 95 percent of the time? What range would you expect to see 99 percent of the time?