26. Gas Prices Using the data from the preceding exercise, find the best predicted price for mid-grade gas for a station that posted $2.78 as the price of regular gas. Is the result close to the actual price of $2.84 for mid-grade gas?

27. Sports Find the best predicted circumference of a marble with a diameter of 1.50 cm. How does the result compare to the actual circumference of 4.7 cm?

	Baseball	Basketball	Golf	Soccer	Tennis	Ping-Pong	Volleyball	Softball
Diameter	7.4	23.9	4.3	21.8	7.0	4.0	20.9	9.7
Circumference	23.2	75.1	13.5	68.5	22.0	12.6	65.7	30.5
Volume	212.2	7148.1	41.6	5424.6	179.6	33.5	4780.1	477.9

28. Sports Using the data from the preceding exercise, find the best predicted volume of a marble with a diameter of 1.50 cm. How does the result compare to the actual volume of 1.8 cm^3?

Large Data Sets. ***Exercises 29–32 use the same Appendix B data sets as Exercises 29–32 in Section 10-2. In each case, find the regression equation, letting the first variable be the predictor (x) variable. Find the indicated predicted values following the prediction procedure summarized in Figure 10-5.***

29. IQ and Brain Volume Refer to Data Set 6 in Appendix B and use the paired data consisting of IQ score and brain volume (cm^3). Find the best predicted IQ score for someone with a brain volume of 1000 cm^3.

30. Flight Delays Refer to Data Set 15 in Appendix B and use the departure delay times and the arrival delay times. Find the best predicted arrival delay time for a flight with no departure delay.

31. Word Counts of Men and Women Refer to Data Set 17 in Appendix B and use the word counts measured from men and women in couple relationships listed in the first two columns of Data Set 17. Find the best predicted word count for a woman who is in a couple relationship with a man having a word count of 10,000.

32. Earthquakes Refer to Data Set 16 in Appendix B and use the magnitudes and depths from the earthquakes. Find the best predicted depth of an earthquake with a magnitude of 1.50.

10-3 Beyond the Basics

33. Equivalent Hypothesis Tests Explain why a test of the null hypothesis H_0: $\rho = 0$ is equivalent to a test of the null hypothesis H_0: $\beta_1 = 0$, where ρ is the linear correlation coefficient for a population of paired data, and β_1 is the slope of the regression line for that same population.

34. Least-Squares Property According to the least-squares property, the regression line minimizes the sum of the squares of the residuals. Refer to the data in Table 10-1.

a. Find the sum of squares of the residuals.

b. Show that the regression equation $\hat{y} = 120 + 2.00x$ results in a larger sum of squares of residuals.