28. Sports Repeat the preceding exercise using diameters and volumes.

Large Data Sets. ***In Exercises 29–32, use the data from Appendix B to construct a scatterplot, find the value of the linear correlation coefficient r, and find either the P-value or the critical values of r from Table A-6 using $\alpha = 0.05$. Determine whether there is sufficient evidence to support the claim of a linear correlation between the two variables. (Save your work because the same data sets will be used in Section 10-3 exercises.)***

29. IQ and Brain Volume Refer to Data Set 6 in Appendix B and use the paired data consisting of brain volume (cm^3) and IQ score.

30. Flight Delays Refer to Data Set 15 in Appendix B and use the departure delay times and the arrival delay times.

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.

32. Earthquakes Refer to Data Set 16 in Appendix B and use the magnitudes and depths from the earthquakes.

10-2 Beyond the Basics

33. Transformed Data In addition to testing for a linear correlation between x and y, we can often use *transformations* of data to explore other relationships. For example, we might replace each x value by x^2 and use the methods of this section to determine whether there is a linear correlation between y and x^2. Given the paired data in the accompanying table, construct the scatterplot and then test for a linear correlation between y and each of the following. Which case results in the largest value of r?

a. x **b.** x^2 **c.** $\log x$ **d.** $\sqrt{x}$ **e.** $1/x$

x	2	3	20	50	95
y	0.3	0.5	1.3	1.7	2.0

34. Finding Critical *r* Values Table A-6 lists critical values of r for selected values of n and α. More generally, critical r values can be found by using the formula

$$r = \frac{t}{\sqrt{t^2 + n - 2}}$$

where the t value is found from the table of critical t values (Table A-3) assuming a two-tailed case with $n - 2$ degrees of freedom. Use the formula for r given here and Table A-3 (with $n - 2$ degrees of freedom) to find the critical r values corresponding to H_1: $\rho \neq 0$, $\alpha = 0.02$, and $n = 27$.