

11. Measuring Seals from Photos Listed below are the overhead widths (in cm) of seals measured from photographs and the weights of the seals (in kg). The data are based on “Mass Estimation of Weddell Seals Using Techniques of Photogrammetry,” by R. Garrett of Montana State University. The purpose of the study was to determine if weights of seals could be determined from overhead photographs. Is there sufficient evidence to conclude that there is a correlation between overhead widths of seals from photographs and the weights of the seals?

Overhead width	7.2	7.4	9.8	9.4	8.8	8.4
Weight	116	154	245	202	200	191

12. Crickets and Temperature The association between the temperature and the number of times a cricket chirps in 1 min was studied. Listed below are the numbers of chirps in 1 min and the corresponding temperatures in degrees Fahrenheit (based on data from *The Song of Insects* by George W. Pierce, Harvard University Press). Is there sufficient evidence to conclude that there is a relationship between the number of chirps in 1 min and the temperature?

Chirps in 1 min	882	1188	1104	864	1200	1032	960	900
Temperature (°F)	69.7	93.3	84.3	76.3	88.6	82.6	71.6	79.6

Appendix B Data Sets. In Exercises 13–16, use the data from Appendix B to test for rank correlation with a 0.05 significance level.

13. Blood Pressure Refer to the measured systolic and diastolic blood pressure measurements of 40 randomly selected males in Data Set 1 in Appendix B and test the claim that among men, there is a correlation between systolic blood pressure and diastolic blood pressure.

14. IQ and Brain Volume Refer to Data Set 6 in Appendix B and use the paired data consisting of brain volume (cm³) and IQ score.

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

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

13-6 Beyond the Basics

17. Finding Critical Values An alternative to using Table A-9 to find critical values for rank correlation is to compute them using this approximation:

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

Here t is the critical t value from Table A-3 corresponding to the desired significance level and $n - 2$ degrees of freedom. Use this approximation to find critical values of r_s for the following cases. Are the resulting approximations close to the values from Table A-9?

a. $n = 8$, $\alpha = 0.05$

b. $n = 30$, $\alpha = 0.01$