

the mean time required to earn a bachelor's degree is greater than 4.0 years. Is there anything about the data that would suggest that the conclusion might not be valid?

4 4 4 4 4 4 4.5 4.5 4.5 4.5 4.5 4.5 6 6 8 9 9 13 13 15

**20. Ages of Race Car Drivers** Listed below are the ages (years) of randomly selected race car drivers (based on data reported in *USA Today*). Use a 0.05 significance level to test the claim that the mean age of all race car drivers is greater than 30 years.

32 32 33 33 41 29 38 32 33 23 27 45 52 29 25

**21. Lead in Medicine** Listed below are the lead concentrations (in  $\mu\text{g/g}$ ) measured in different Ayurveda medicines. Ayurveda is a traditional medical system commonly used in India. The lead concentrations listed here are from medicines manufactured in the United States. The data are based on the article "Lead, Mercury, and Arsenic in US and Indian Manufactured Ayurvedic Medicines Sold via the Internet," by Saper, et al., *Journal of the American Medical Association*, Vol. 300, No. 8. Use a 0.05 significance level to test the claim that the mean lead concentration for all such medicines is less than  $14 \mu\text{g/g}$ .

3.0 6.5 6.0 5.5 20.5 7.5 12.0 20.5 11.5 17.5

**22. Brain Volume** Listed below are brain volumes ( $\text{cm}^3$ ) of unrelated subjects used in a study. (See Data Set 6 in Appendix B.) Use a 0.01 significance level to test the claim that the population of brain volumes has a mean equal to  $1100.0 \text{ cm}^3$ .

963 1027 1272 1079 1070 1173 1067 1347 1100 1204

**23. Heights of Supermodels** Listed below are the heights (inches) for the simple random sample of supermodels Lima, Bundchen, Ambrosio, Ebanks, Iman, Rubik, Kurkova, Kerr, Kroes, and Swanepoel. Use a 0.01 significance level to test the claim that supermodels have heights with a mean that is greater than the mean height of 63.8 in. for women in the general population. Given that there are only 10 heights represented, can we really conclude that supermodels are taller than the typical woman?

70 71 69.25 68.5 69 70 71 70 70 69.5

**24. Highway Speeds** Listed below are speeds (mi/h) measured from southbound traffic on I-280 near Cupertino, California (based on data from SigAlert). This simple random sample was obtained at 3:30 P.M. on a weekday. Use a 0.05 significance level to test the claim that the sample is from a population with a mean that is less than the speed limit of 65 mi/h.

62 61 61 57 61 54 59 58 59 69 60 67

**Large Data Sets from Appendix B.** In Exercises 25–28, use the data set from Appendix B to test the given claim. Identify the null hypothesis, alternative hypothesis, test statistic, P-value or critical value(s), conclusion about the null hypothesis, and final conclusion that addresses the original claim. Use the P-value method unless your instructor specifies otherwise.

**25. Earthquake Magnitudes** Use the earthquake magnitudes listed in Data Set 16 in Appendix B and test the claim that the population of earthquakes has a mean magnitude greater than 1.00. Use a 0.05 significance level.

**26. Blood Pressure** Use the systolic blood pressure measurements for females listed in Data Set 1 in Appendix B and test the claim that the female population has a mean systolic blood pressure level less than 120.0 mm Hg. Use a 0.05 significance level.