by Flesch and Ostler, *MathAMATYC Educator,* Vol. 2, No. 1). Use a 0.01 significance level to test the claim that students taking nonproctored tests get a higher mean than those taking proctored tests.

Group 1 (Proctored): $n = 30, \bar{x} = 74.30, s = 12.87$

Group 2 (Nonproctored): $n = 32, \bar{x} = 88.62, s = 22.09$

**14. Proctored and Nonproctored Tests** In the same study described in the preceding exercise, the same groups of students took a nonproctored test; the results are given below. Use a 0.01 significance level to test the claim that the samples are from populations with the same mean.

Group 1 (Nonproctored): $n = 30, \bar{x} = 70.29, s = 22.09$

Group 2 (Nonproctored): $n = 32, \bar{x} = 74.26, s = 18.15$

**15. BMI** We know that the mean weight of men is greater than the mean weight of women, and the mean height of men is greater than the mean height of women. A person's body mass index (BMI) is computed by dividing weight (kg) by the square of height (m). Given below are the BMI statistics for random samples of males and females from Data Set 1 in Appendix B. Use a 0.05 significance level to test the claim that males and females have the same mean BMI.

Male BMI $n = 40, \bar{x} = 28.44075, s = 7.394076$

Female BMI $n = 40, \bar{x} = 26.6005, s = 5.359442$

**16. IQ and Lead Exposure** Data Set 5 in Appendix B lists full IQ scores for a random sample of subjects with low lead levels in their blood and another random sample of subjects with high lead levels in their blood. The statistics are summarized below. Use a 0.05 significance level to test the claim that the mean IQ score of people with low lead levels is higher than the mean IQ score of people with high lead levels.

Low Lead Level: $n = 78, \bar{x} = 92.88462, s = 15.34451$

High Lead Level: $n = 21, \bar{x} = 86.90476, s = 8.988352$

**17. IQ and Lead Exposure** Repeat Exercise 16 after replacing the low lead level group with the following full IQ scores from the medium lead level group.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 72 | 90 | 92 | 71 | 86 | 79 | 83 | 114 | 100 | 93 | 91 |
| 98 | 91 | 46 | 85 | 82 | 97 | 91 | 92 | 77 | 111 | 78 |

**18. 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. Data Set 1 in Appendix B includes the heights of a simple random sample of 40 women from the general population, and here are the statistics for those heights: $n = 40, \bar{x} = 63.7815$ in., and $s = 2.59665$ in. Use a 0.01 significance level to test the claim that the supermodels have heights with a mean that is greater than the mean height of women in the general population.

70 71 69.25 68.5 69 70 71 70 70 69.5

**19. Longevity** Listed below are the numbers of years that popes and British monarchs (since 1690) lived after their election or coronation (based on data from *Computer-Interactive Data Analysis,* by Lunn and McNeil, John Wiley & Sons). Treat the values as simple random samples from a larger population. Use a 0.01 significance level to test the claim that the mean longevity for popes is less than the mean for British monarchs after coronation.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Popes: | 2 | 9 | 21 | 3 | 6 | 10 | 18 | 11 | 6 | 25 | 23 | 6 | | |
| | 2 | 15 | 32 | 25 | 11 | 8 | 17 | 19 | 5 | 15 | 0 | 26 | | |
| Kings and Queens: | 17 | 6 | 13 | 12 | 13 | 33 | 59 | 10 | 7 | 63 | 9 | 25 | 36 | 15 |