College Prep. Stats. Name: _____
Chapter 3 Review

1. When designing a new thrill ride for an amusement park, the designer must consider the sitting heights of males. Listed below are the sitting heights (in millimeters) obtained from a simple random sample of adult males (based on anthropometric survey data from Gordon, Churchill, et al.).

936 928 924 880 934 923 878 930 936

Use the given sitting heights to find the

(a) mean (b) median (c) mode (d) midrange (e) range

(f) standard deviation (g) variance (h) Q_1 (i) Q_3. (j) Q_2

2. Using the sample data from problem number 1, find the *z* score corresponding to the sitting height of 878 mm. Based on the result, is the sitting height of 878 mm unusual? Why or why not?

3. Using the same sitting heights listed in problem number 1, construct a boxplot and include the values of the 5-number summary. Does the boxplot suggest that the data are from a population with a normal (bell-shaped) distribution? Why or why not?

4. SAT scores have a mean of 1518 and a standard deviation of 325. Scores on the ACT test have a mean of 21.1 and a standard deviation of 4.8. Which is relatively better: a score of 1030 on the SAT test or a score of 14.0 on the ACT test? Why?

5. Use the range rule of thumb to make a rough estimate of the standard deviation of the ages of cars driven by students at your high school if the newest car is 1 year old and the oldest car is 15 years old.

6. A physician routinely makes physical examinations of children. She is concerned that a three-year-old girl has a height of only 87.8 cm. Heights of three-year-old girls have a mean of 97.5 cm and a standard deviation of 6.9 cm (based on data from the National Health and Nutrition Examination Survey). Use the range rule of thumb to find the maximum and minimum usual heights of three-year-old girls. Based on the result, is the height of 87.8 cm unusual? Should the physician be concerned?

7. The frequency distribution below summarizes the word counts of 186 men from Data Set 8 from Appendix B of your textbook.

a) Use $\bar{x} = \dfrac{\sum(fx)}{\sum f}$ to find the mean.

b) Use $s = \sqrt{\dfrac{n\left[\sum(fx^2)\right] - \left[\sum(fx)\right]^2}{n(n-1)}}$ to find the standard deviation. (**not required, skip**)

Word Counts from Men	**Mid Points (*x*)**	**Frequency (*f*)**			
0 – 9,999		46			
10,000 – 19,999		90			
20,000 – 29,999		40			
30,000 – 39,999		7			
40,000 – 49,999		3			

8. The sorted test scores of 40 students are listed below. Find P_{22}.

30 35 43 44 47 48 54 55 56 57 59 62 63 65 66 68 69 69 71 72
72 73 74 76 77 77 78 79 80 81 81 82 83 85 89 92 93 94 97 125

9. Use the data from number 8 to create a modified boxplot and identify any outliers. Use the 1.5 IQR rule to verify the outliers. (Work must be shown for credit)

10. In a data set with 422 observations, there are 241 observations with values less than 74.7. Find the percentile for 74.7.

11. A student earned grades of D, B, A, and B. Those courses had these corresponding numbers of credit hours: 4, 5, 1, and 5. The grading system assigns quality points to letter grades as follows: A = 4, B = 3, C = 2, D = 1, and F = 0. Compute the grade point average (GPA) and round the result to two decimal places.

12. **Use the empirical rule to solve the problem:** The amount of George's monthly heating bill is normally distributed with a mean of $138 and a standard deviation of $12. What percentage of his heating bills are between $126 and $150? You must draw a bell curve.

13. The test scores on a science test have a mean of 79 and a standard deviation of 8. Andrea scored an 72 on the test. How many standard deviations from the mean is that?

14. A *z*-score of 1.7 was found from an observation coming from a normal distribution with mean 14 and standard deviation 3. Find the raw score.

15. Draw a box plot using your calculator for the data below. Be sure to label the box plot with all information

79 47 55 83 145 44 61 18 78 62

16. Using the data from problem number 15, create a modified boxplot. What is/are the outlier(s)? Use the 1.5 IQR rule to verify the outliers. (Work must be shown for credit)

17. Suppose a student sits for 2 exams, getting 55 in a verbal test and 60 in a numerical reasoning test. For the verbal test, the mean is 50 and standard deviation 5; for the numerical test, the mean is 50 and standard deviation is 12. Which is a better score?

18. The following tables show the frequency distribution of the diameters of 40 bottles. Find the mean from the frequency distribution.

Diameter(mm)	Frequency				
35-39	6				
40-44	12				
45-49	15				
50-54	10				
55-59	7				

Use the following information for numbers 19 – 24:
The given values are service times (in seconds) of McDonald's drive-through customers.

88 107 35 93 65 55 119 83 99 74 46 108

19. Find the median.

20. Find the mean.

21. Find the standard deviation.

22. Find the variance.

23. Find the midrange.

24. Find the mode(s).

25. The test scores on the Chapter 2 mathematics test have a mean of 68 and a standard deviation of 10. Jon scored a 73 on the test. How many standard deviations from the mean is that?

26. The sorted test scores of 30 students are listed below. Find the percentile of the score of 70.

48 48 52 55 57 59 64 65 67 68 70 70 70 71 72
72 74 76 77 79 80 81 82 83 85 89 92 93 94 97

27. Find the *z*-score corresponding to the given value and use the *z*-score to determine whether the value is unusual. Human body temperatures have a mean of 98.20° F and a standard deviation of 0.62°. Your temperature is 96.90°F.

28. Lengths of pregnancies have a mean of 268 days and a standard deviation of 15 days. A certain woman's *z*-score was 2.67. How many days was she pregnant? Round to the nearest number of days.