

CHAPTER 3 FORM B

Name _____ Course Number: _____ Section Number: _____

Directions: Answer the questions in the spaces provided, or attach paper. Circle the correct choice for each response set. If required, show calculations in the blank spaces near the problems.

Provide an appropriate response.

- 1) The table below provides a frequency distribution for the winner of the Davis Cup during the period 1977-1994.

Winner of Davis Cup	Frequency
United States	6
Germany	3
Czechoslovakia	1
Australia	3
France	1
Sweden	4

Which measure of center, the mean, the median, or the mode is most appropriate here? Why?

Find the mean for the given sample data. Unless indicated otherwise, round your answer to one more decimal place than is present in the original data values.

- 2) The students in Hugh Logan's math class took the Scholastic Aptitude Test. Their math scores are shown below. Find the mean score.

528 505 342 348 492
346 349 643 470 482

- A) 450.5 B) 459.7 C) 476.0 D) 441.7

Find the median for the given sample data.

- 3) Listed below are the amounts of time (in months) that the employees of a restaurant have been working at the restaurant. Find the median.

12 4 6 8.5 12 16 17 32 53 85 99 123 140 167

- A) 54.6 months B) 58.7 months C) 17 months D) 24.5 months

Find the mode(s) for the given sample data.

- 4) Listed below are the lengths (in inches) of each snake in the Clarmont Zoo's reptile house.

9 15 78 13 16 101 19 10 14 17 102

- A) 13.9 in.
 B) 11 in.
 C) no mode
 D) 9 in., 15 in., 78 in., 13 in., 16 in., 101 in., 19 in., 10 in., 14 in., 17 in., 102 in.

Find the midrange for the given sample data.

- 5) Bill kept track of the number of hours he spent exercising each week. The results for 15 weeks are shown below. Find the midrange.

7.0 6.6 7.0 7.3 7.5
 7.8 6.6 8.0 8.3 7.3
 8.6 6.6 7.8 9.0 7.5

- A) 7.60 hr B) 2.4 hr C) 7.80 hr D) 7.5 hr

Find the mean of the data summarized in the given frequency distribution.

- 6) The manager of a bank recorded the amount of time each customer spent waiting in line during peak business hours one Monday. The frequency distribution below summarizes the results. Find the mean waiting time. Round your answer to one decimal place.

Waiting time (minutes)	Number of customers
0 - 3	12
4 - 7	15
8 - 11	11
12 - 15	8
16 - 19	4
20 - 23	1
24 - 27	2

- A) 7.6 min B) 8.6 min C) 8.8 min D) 13.5 min

Solve the problem.

- 7) A student earned grades of C, A, B, and A. Those courses had these corresponding numbers of credit hours: 4, 5, 2, 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.

- A) 10.50 B) 3.82 C) 3.38 D) 2.23

- 8) The harmonic mean is often used as a measure of center for data sets consisting of rates of change, such as speeds. It is found by dividing the number of values (n) by the sum of the reciprocals of all values, expressed as

$$\frac{n}{\sum(1/x)}$$

Pierre drives to work (a distance of 47 miles) at a speed of 66 mph and returns home at a speed of 54 mph. What is his average speed for the round trip? Use the harmonic mean.

- A) 59.4 mph B) 61.2 mph C) 59.7 mph D) 60.0 mph

Find the variance for the given data. Round your answer to one more decimal place than the original data.

- 9) The owner of a small manufacturing plant employs six people. As part of their personnel file, she asked each one to record to the nearest one-tenth of a mile the distance they travel one way from home to work. The six distances are listed below:

34 57 25 13 51 44

- A) 274.7 mi² B) 9485.1 mi² C) 43.9 mi² D) 36.7 mi²

Find the coefficient of variation for each of the two sets of data, then compare the variation. Round results to one decimal place.

- 10) The customer service department of a phone company is experimenting with two different systems. On Monday they try the first system which is based on an automated menu system. On Tuesday they try the second system in which each caller is immediately connected with a live agent. A quality control manager selects a sample of seven calls each day. He records the time for each customer to have his or her question answered. The times (in minutes) are listed below.

Automated Menu: 11.8 7.6 4.3 2.9 9.2 6.3 5.5

Live agent: 6.4 2.6 4.6 4.1 3.4 5.2 3.7

- A) Automated Menu: 46.1%
Live agent: 30.3%
There is substantially more variation in the times for the automated menu system.
- B) Automated Menu: 24.7%
Live agent: 46.0%
There is substantially more variation in the times for the live agent.
- C) Automated Menu: 44.4%
Live agent: 29.2%
There is substantially more variation in the times for the automated menu system.
- D) Automated Menu: 47.7%
Live agent: 31.4%
There is substantially more variation in the times for the automated menu system.

Use the range rule of thumb to estimate the standard deviation. Round results to the nearest tenth.

- 11) A distribution of data has a maximum value of 64, a median value of 55, and a minimum of 46.

- A) 3.6 B) 9.0 C) 2.4 D) 4.5

Use the empirical rule to solve the problem.

- 12) The systolic blood pressure of 18-year-old women is normally distributed with a mean of 120 mmHg and a standard deviation of 12 mmHg. What percentage of 18-year-old women have a systolic blood pressure between 96 mmHg and 144 mmHg?
- A) 99.99% B) 99.7% C) 95% D) 68%

Solve the problem.

- 13) Skewness can be measured by Pearson's index of skewness:

$$I = \frac{3(\bar{x} - \text{median})}{s}$$

If $I \geq 1.00$ or $I \leq -1.00$, the data can be considered significantly skewed. Would you expect that incomes of all adults in the US would be skewed? In which direction? Why? Would you expect that for these incomes, Pearson's index of skewness would be greater than 1, smaller than -1, or between -1 and 1?

Find the number of standard deviations from the mean. Round your answer to two decimal places.

- 14) In one town, the number of pounds of sugar consumed per person per year has a mean of 5 pounds and a standard deviation of 1.3 pounds. Tyler consumed 12 pounds of sugar last year. How many standard deviations from the mean is that?
- A) 2.33 standard deviations below the mean
 B) 5.38 standard deviations above the mean
 C) 2.33 standard deviations above the mean
 D) 5.38 standard deviations below the mean

Find the z-score corresponding to the given value and use the z-score to determine whether the value is unusual. Consider a score to be unusual if its z-score is less than -2.00 or greater than 2.00. Round the z-score to the nearest tenth if necessary.

- 15) A test score of 85.0 on a test having a mean of 68 and a standard deviation of 10.
- A) 1.7; not unusual B) 1.7; unusual
 C) 17; unusual D) -1.7; not unusual

Determine which score corresponds to the higher relative position.

- 16) Which score has a higher relative position, a score of 53.8 on a test for which $\bar{x} = 37$ and $s = 8$, or a score of 375.4 on a test for which $\bar{x} = 283$ and $s = 44$?
- A) A score of 53.8
 B) A score of 375.4
 C) Both scores have the same relative position.

Find the percentile for the data value.

17) Data set: 4 6 14 12 4 10 18 18 22 6 6 18 12 2 18;
data value: 14

- A) 35 B) 70 C) 52 D) 60

Find the indicated measure.

18) Use the given sample data to find Q_1 .

49 52 52 52 74 67 55 55

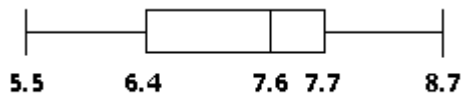
- A) 55.0 B) 61.0 C) 67.0 D) 52.0

Construct a boxplot for the given data. Include values of the 5-number summary in all boxplots.

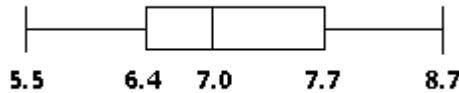
19) The weights (in pounds) of 30 newborn babies are listed below. Construct a boxplot for the data set.

5.5 5.7 5.8 5.9 6.1 6.1 6.3 6.4 6.5 6.6
6.7 6.7 6.7 6.9 7.0 7.0 7.0 7.1 7.2 7.2
7.4 7.5 7.7 7.7 7.8 8.0 8.1 8.1 8.3 8.7

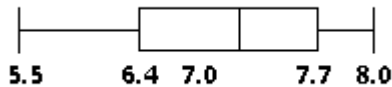
A)



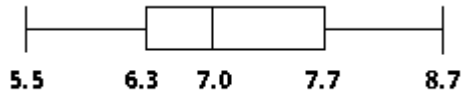
B)



C)



D)



Provide an appropriate response.

20) Suppose that all the values in a data set are converted to z-scores. Which of the statements below is true?

A: The mean of the z-scores will be zero, and the standard deviation of the z-scores will be the same as the standard deviation of the original data values.

B: The mean and standard deviation of the z-scores will be the same as the mean and standard deviation of the original data values.

C: The mean of the z-scores will be 0, and the standard deviation of the z-scores will be 1.

D: The mean and the standard deviation of the z-scores will both be zero.

A) D

B) B

C) C

D) A

Answer Key

Testname: CHAPTER 3 FORM B

- 1) The mode. Since the data are not numerical, it is not possible to find the median or mean. The mode is the only measure of center that can be used with data at the nominal level of measurement.
- 2) A
- 3) D
- 4) C
- 5) C
- 6) B
- 7) C
- 8) A
- 9) A
- 10) C
- 11) D
- 12) C
- 13) Incomes are likely to be skewed to the right as the mean is likely to be larger than the median. This is because the mean is pulled to the right by the few very large incomes. The median is unaffected by these extreme values. Pearson's index of skewness is likely to be greater than 1.
- 14) B
- 15) A
- 16) C
- 17) D
- 18) D
- 19) B
- 20) C