

CHAPTER 3 FORM C

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) Suppose that a state introduces a state income tax which will be at a flat rate of 3%. The state legislature wishes to estimate how much money they will receive in taxes, and to do this they need to know the average income of residents of the state. Which information would be most useful, the mean income, the median income, or the mode of the incomes? 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) Listed below are the amounts of time (in months) that the employees of a restaurant have been working at the restaurant. Find the mean.

1 4 7 8 12 15 19 43 66 87 99 127 148 167

- A) 53.5 months B) 31 months C) 57.4 months D) 61.8 months

Find the median for the given sample data.

- 3) The ages (in years) of the eight passengers on a bus are listed below.

6 3 23 19 25 42 37 35

Find the median age.

- A) 25 yr B) 23.5 yr C) 23 yr D) 24 yr

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

- 4) -20 -40 -46 -40 -49 -40 -49

- A) -46 B) -40 C) -40.6 D) -49

Find the midrange for the given sample data.

- 5) A meteorologist records the number of clear days in a given year in each of 21 different U.S. cities. The results are shown below. Find the midrange.

72 143 52 84 100 98 101

120 99 121 86 60 59 71

125 130 104 74 83 55 169

- A) 110.5 days B) 117 days C) 112 days D) 98 days

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

- 6) The heights of a group of professional basketball players are summarized in the frequency distribution below. Find the mean height. Round your answer to one decimal place.

Height (in.)	Frequency
70 - 71	1
72 - 73	6
74 - 75	10
76 - 77	12
78 - 79	8
80 - 81	6
82 - 83	1

- A) 13.5 in. B) 78.2 in. C) 74.7 in. D) 76.4 in.

Solve the problem.

- 7) A student earned grades of 78, 78, 91, and 91 on her four regular tests. She earned a grade of 78 on the final exam and 87 on her class projects. Her combined homework grade was 87. The four regular tests count for 40% of the final grade, the final exam counts for 30%, the project counts for 10%, and homework counts for 20%. What is her weighted mean grade? Round to one decimal place.

- A) 84.2 B) 82.8 C) 83.3 D) 84.3

- 8) The quadratic mean (or root mean square) is usually used in physical applications. In power distribution systems, for example, voltages and currents are usually referred to in terms of their root mean square value. The quadratic mean of a set of values is obtained by squaring each value, adding the results, dividing by the number of values (n), and then taking the square root of that result, expressed as

$$\text{quadratic mean} = \sqrt{\frac{\sum x^2}{n}}$$

Find the root mean square of these power supplies (in volts): 116, 82, 88, 41.

- A) 163.5 volts B) 86.0 volts C) 43.0 volts D) 81.8 volts

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

- 9) To get the best deal on a microwave oven, Jeremy called six appliance stores and asked the cost of a specific model. The prices he was quoted are listed below:

\$235 \$625 \$608 \$165 \$289 \$665

- A) 42,176.1 dollars² B) 50,611.4 dollars²
 C) 50,611.3 dollars² D) 1,335,022.2 dollars²

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

- 10) Compare the variation in heights to the variation in weights of thirteen-year old girls. The heights (in inches) and weights (in pounds) of nine randomly selected thirteen-year old girls are listed below.

Heights (inches): 58.9 61.5 62.3 64.7 60.1 58.3 64.6 63.7 66.1
 Weights (pounds): 89 95 92 119 96 90 123 98 139

- A) Heights: 11.7%
 Weights: 6.4%
 There is substantially more variation in the heights than in the weights of the girls.
- B) Heights: 4.4%
 Weights: 17.1%
 There is substantially more variation in the weights than in the heights of the girls.
- C) Heights: 4.6%
 Weights: 17.9%
 There is substantially more variation in the weights than in the heights of the girls.
- D) Heights: 4.2%
 Weights: 16.3%
 There is substantially more variation in the weights than in the heights of the girls.

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

- 11) The following is a set of data showing the water temperature in a heated tub at different time intervals.

114.0 113.2 116.3 113.4 115.9 114.2 113.0 114.1

- A) 0.6 B) 1.1 C) -56.1 D) 0.8

Use the empirical rule to solve the problem.

- 12) The amount of Jen's monthly phone bill is normally distributed with a mean of \$79 and a standard deviation of \$8. What percentage of her phone bills are between \$55 and \$103?

- A) 68% B) 95% C) 99.99% D) 99.7%

Solve the problem.

- 13) In chemistry, the Kelvin scale is often used to measure temperatures. On the Kelvin scale, zero degrees is *absolute zero*. Temperatures on the Kelvin scale are related to temperatures on the Celsius scale as follows: $K = C + 273^\circ$. Temperatures on the Fahrenheit scale are related to temperatures on the Celsius scale as follows:

$$F = \frac{9C}{5} + 32^\circ.$$

A set of temperatures is given in Celsius, Kelvin, and Fahrenheit. How will the standard deviations of the three sets of data compare?

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

- 14) The number of hours per day a college student spends on homework has a mean of 4 hours and a standard deviation of 1.25 hours. Yesterday she spent 2 hours on homework. How many standard deviations from the mean is that?
- A) 0.80 standard deviations below the mean
 - B) 0.80 standard deviations above the mean
 - C) 1.60 standard deviations below the mean
 - D) 1.60 standard deviations above 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 time for the 100 meter sprint of 20.4 seconds at a school where the mean time for the 100 meter sprint is 17.5 seconds and the standard deviation is 2.1 seconds.
- A) 2.9; unusual
 - B) -1.4; not unusual
 - C) 1.4; not unusual
 - D) 1.4; unusual

Determine which score corresponds to the higher relative position.

- 16) Which score has a higher relative position, a score of 278.4 on a test for which $\bar{x} = 240$ and $s = 24$, or a score of 66 on a test for which $\bar{x} = 60$ and $s = 6$?
- A) A score of 66
 - B) A score of 278.4
 - C) Both scores have the same relative position.

Find the percentile for the data value.

- 17) Data set: 53 41 42 66 70 74 31;
data value: 53
- A) 20
 - B) 43
 - C) 57
 - D) 50

Find the indicated measure.

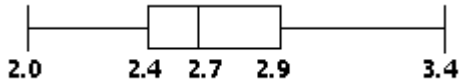
- 18) Use the given sample data to find P_{80} .
- 49 52 52 52 74 67 55 55
- A) 6.0
 - B) 61.0
 - C) 67.0
 - D) 55.0

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

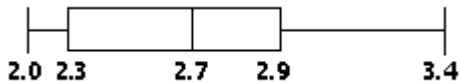
19) The weights (in ounces) of 27 tomatoes are shown below. Construct a boxplot for the data set.

2.0 2.1 2.2 2.2 2.4 2.4 2.5 2.5 2.5
 2.6 2.6 2.7 2.7 2.7 2.7 2.8 2.8 2.8
 2.9 2.9 3.0 3.0 3.0 3.1 3.1 3.2 3.4

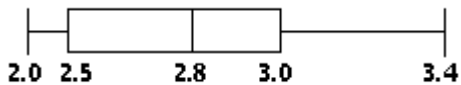
A)



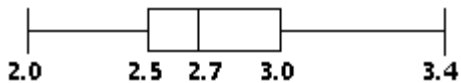
B)



C)



D)



Provide an appropriate response.

20) Human body temperatures have a mean of 98.20° F and a standard deviation of 0.62°. Sally's temperature can be described by $z = -1.3$. What is her temperature? Round your answer to the nearest hundredth.

A) 97.39°F

B) 99.01°F

C) 96.11°F

D) 96.90°F

Answer Key

Testname: CHAPTER 3 FORM C

- 1) The mean income would be the most useful as it takes into account the numerical value of all incomes and thus best predicts how much tax will be paid.
- 2) C
- 3) D
- 4) B
- 5) A
- 6) D
- 7) C
- 8) B
- 9) B
- 10) B
- 11) D
- 12) D
- 13) The set of temperatures in Celsius and the set of temperatures in Kelvin will have the same standard deviation. The standard deviation of the set of temperatures in Fahrenheit can be obtained by multiplying the standard deviation of the set of temperatures in Celsius by $\frac{9}{5}$.
- 14) C
- 15) C
- 16) B
- 17) B
- 18) C
- 19) D
- 20) A