Student: _____	**Instructor:** Andrea Steel	**Assignment:** Homework 3 - Chapter 3 (
Date: _____	**Course:** Math 160 Fall 2019 A	ASSIGNMENT 10 pts) Due 9/3/19

1. Find the (a) mean, (b) median, (c) mode, and (d) midrange for the given sample data.

An experiment was conducted to determine whether a deficiency of carbon dioxide in the soil affects the phenotype of peas. Listed below are the phenotype codes where 1 = smooth-yellow, 2 = smooth-green, 3 = wrinkled-yellow, and 4 = wrinkled-green. Do the results make sense?

4 2 1 1 2 2 2 4 1 2 4 2 3 1

(a) The mean phenotype code is _____.
(Round to the nearest tenth as needed.)

(b) The median phenotype code is _____.
(Type an integer or a decimal.)

(c) Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The mode phenotype code is _____.
  (Use a comma to separate answers as needed.)
- **B.** There is no mode.

(d) The midrange of the phenotype codes is _____.
(Type an integer or a decimal.)

Do the measures of center make sense?

- **A.** Only the mode makes sense since the data is nominal.
- **B.** All the measures of center make sense since the data is numerical.
- **C.** Only the mean, median, and midrange make sense since the data is nominal.
- **D.** Only the mean, median, and mode make sense since the data is numerical.

2. Waiting times (in minutes) of customers in a bank where all customers enter a single waiting line and a bank where customers wait in individual lines at three different teller windows are listed below. Find the mean and median for each of the two samples, then compare the two sets of results.

Single Line	6.4	6.5	6.7	6.8	7.0	7.3	7.6	7.7	7.7	7.7
Individual Lines	4.1	5.3	6.0	6.3	6.6	7.7	7.7	8.6	9.1	10.0

The mean waiting time for customers in a single line is _____ minutes.

The median waiting time for customers in a single line is _____ minutes.

The mean waiting time for customers in individual lines is _____ minutes.

The median waiting time for customers in individual lines is _____ minutes.

Determine whether there is a difference between the two data sets that is not apparent from a comparison of the measures of center. If so, what is it?

- **A.** The times for customers in a single line are much more varied than the times for customers in individual lines.
- **B.** The times for customers in individual lines are much more varied than the times for customers in a single line.
- **C.** There is no difference between the two data sets.

3. Find the mean of the data summarized in the given frequency distribution. Compare the computed mean to the actual mean of 56.5 degrees.

Low Temperature (∘ F)	40 − 44	45 − 49	50 − 54	55 − 59	60 − 64
Frequency	2	7	10	7	3

The mean of the frequency distribution is _____ degrees.
(Round to the nearest tenth as needed.)

Which of the following best describes the relationship between the computed mean and the actual mean?

- **A.** The computed mean is close to the actual mean because the difference between the means is less than 5% of the ac
- **B.** The computed mean is close to the actual mean because the difference between the means is more than 5% of the a
- **C.** The computed mean is not close to the actual mean because the difference between the means is more than 5% of t
- **D.** The computed mean is not close to the actual mean because the difference between the means is less than 5% of th

4. Identify the symbols used for each of the following: (a) sample standard deviation; (b) population standard deviation; (c) sample variance; (d) population variance.

a. The symbol for sample standard deviation is (1) _____.

b. The symbol for population standard deviation is (2) _____.

c. The symbol for sample variance is (3) _____.

d. The symbol for population variance is (4) _____.

(1)
- s
- s^2
- σ
- σ^2

(2)
- s
- s^2
- σ
- σ^2

(3)
- s
- s^2
- σ
- σ^2

(4)
- s
- s^2
- σ
- σ^2

5. Listed below are the top 10 annual salaries (in millions of dollars) of TV personalities. Find the range, variance, and standard deviation for the sample data. Given that these are the top 10 salaries, do we know anything about the variation of salaries of TV personalities in general?

41 39 37 29 18 14 12 10 9.7 8.9

The range of the sample data is $ _____ million. (Type an integer or a decimal.)

The variance of the sample data is _____. (Round to two decimal places as needed.)

The standard deviation of the sample data is $ _____ million.
(Round to two decimal places as needed.)

Is the standard deviation of the sample a good estimate of the variation of salaries of TV personalities in general?

- **A.** Yes, because the sample is random.
- **B.** No, because the sample is not representative of the whole population.
- **C.** Yes, because the standard deviation is an unbiased estimator.
- **D.** No, because there is an outlier in the sample data.

6. The blood platelet counts of a group of women have a bell-shaped distribution with a mean of 259.9 and a standard deviation of 64.5. (All units are 1000 cells/μL.) Using the empirical rule, find each approximate percentage below.

   a. What is the approximate percentage of women with platelet counts within 2 standard deviations of the mean, or between 130.9 and 388.9?

   b. What is the approximate percentage of women with platelet counts between 195.4 and 324.4?

a. Approximately _____ % of women in this group have platelet counts within 2 standard deviations of the mean, or between 130.9 and 388.9.
(Type an integer or a decimal. Do not round.)

b. Approximately _____ % of women in this group have platelet counts between 195.4 and 324.4.
(Type an integer or a decimal. Do not round.)

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7. Fill in the blank.

When a data value is converted to a standardized scale representing the number of standard deviations the data value lies from the mean, we call the new value a _____.

When a data value is converted to a standardized scale representing the number of standard deviations the data value lies from the mean, we call the new value a (1) _____

(1)
- ○ mean.
- ○ variation.
- ○ z-score.
- ○ range.

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8. Fill in the blank.

In modified boxplots, a data value is a(n) _____ if it is above $Q_3 + (1.5)(IQR)$ or below $Q_1 - (1.5)(IQR)$.

In modified boxplots, a data value is a(n) (1) _____ if it is above $Q_3 + (1.5)(IQR)$ or below $Q_1 - (1.5)(IQR)$.

(1)
- ○ quartile
- ○ outlier
- ○ z-score
- ○ whisker

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9. Which of the following is NOT a value in the 5-number summary?

Choose the correct answer below.

- ○ Q_1
- ○ Mean
- ○ Median
- ○ Minimum

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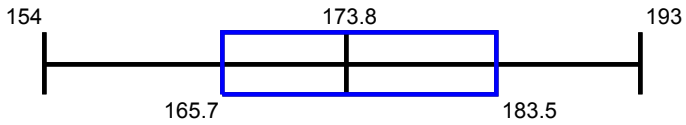
10. A successful basketball player has a height of 6 feet 3 inches, or 191 cm. Based on statistics from a data set, his height converts to the z score of 2.31. How many standard deviations is his height above the mean?

The player's height is _____ standard deviation(s) above the mean.
(Round to two decimal places as needed.)

11. The boxplot shown below results from the heights (cm) of males listed in a data set. What do the numbers in that boxplot tell us?



The minimum height is _____ cm, the first quartile Q_1 is _____ cm, the second quartile Q_2 (or the median) is _____ cm, the third quartile Q_3 is _____ cm, and the maximum height is _____ cm.
(Type integers or decimals. Do not round.)

12. Researchers measured the data speeds for a particular smartphone carrier at 50 airports. The highest speed measured was 75.9 Mbps. The complete list of 50 data speeds has a mean of $\bar{x} = 16.51$ Mbps and a standard deviation of $s = 33.87$ Mbps.

a. What is the difference between carrier's highest data speed and the mean of all 50 data speeds?
b. How many standard deviations is that [the difference found in part (a)]?
c. Convert the carrier's highest data speed to a z score.
d. If we consider data speeds that convert to z scores between -2 and 2 to be neither significantly low nor significantly high, is the carrier's highest data speed significant?

a. The difference is _____ Mbps.
(Type an integer or a decimal. Do not round.)

b. The difference is _____ standard deviations.
(Round to two decimal places as needed.)

c. The z score is $z =$ _____.
(Round to two decimal places as needed.)

d. The carrier's highest data speed is (1) _____

(1) ○ significantly high.
○ significantly low.
○ not significant.

13. Use z scores to compare the given values.

The tallest living man at one time had a height of 258 cm. The shortest living man at that time had a height of 125.8 cm. Heights of men at that time had a mean of 176.81 cm and a standard deviation of 7.49 cm. Which of these two men had the height that was more extreme?

Since the z score for the tallest man is $z =$ _____ and the z score for the shortest man is $z =$ _____, the

(1) _____ man had the height that was more extreme.
(Round to two decimal places.)

(1) ○ tallest
○ shortest

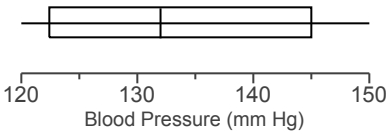
14. Fourteen different second-year medical students at a hospital measured the blood pressure of the same person. The systolic readings (mm Hg) are listed below. Use the given data to construct a boxplot and identify the 5-number summary.

130 124 135 125 120 125 150 130 134 146 139 140 128 150

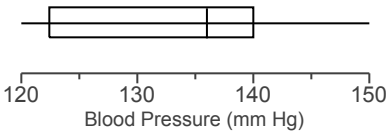
The 5-number summary is _____, _____, _____, _____, and _____, all in mm Hg.
(Use ascending order. Type integers or decimals. Do not round.)

Which boxplot below represents the data?

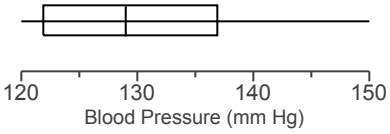
A.



B.



C.



D.