## Chapter 3 Worksheet

Math 160

Name $\qquad$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
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.

1) The amount of time (in hours) that Sam studied for an exam on each of the last five days is given below. Find the mean study time.
$\begin{array}{lllll}1.7 & 7.7 & 8.3 & 1.6 & 5.1\end{array}$

Find the median for the given sample data.
2) Listed below are the amounts of time (in months) that the employees of a restaurant have been working at the restaurant. Find the median.
$\begin{array}{llllllllllllll}12 & 4 & 7 & 8.5 & 11 & 16 & 18 & 33 & 58 & 87 & 99 & 125 & 140 & 167\end{array}$

Solve the problem.
3) A sociologist recently conducted a survey of senior citizens who have net worths too high to qualify for Medicaid but have no private health insurance. The ages of the 25 uninsured senior citizens were as follows:

| 67 | 72 | 65 | 75 | 85 |
| :--- | :--- | :--- | :--- | :--- |
| 73 | 60 | 88 | 64 | 89 |
| 68 | 91 | 75 | 61 | 80 |
| 62 | 67 | 80 | 69 | 72 |
| 59 | 86 | 74 | 63 | 81 |

Find the mean and median of the observations.

Find the mode(s) for the given sample data.
4) The weights (in ounces) of 14 different apples are shown below.
4) $\qquad$
$\begin{array}{lllllll}4.9 & 4.6 & 5.1 & 4.2 & 4.8 & 4.9 & 4.6\end{array}$
$\begin{array}{lllllll}4.3 & 4.1 & 4.2 & 4.9 & 4.3 & 4.2 & 5.4\end{array}$
5) $\begin{array}{lllllll}66 & 25 & 66 & 13 & 25 & 29 & 56\end{array} 66$
2) $\qquad$
3) $\qquad$



$\qquad$
1)
$\square$
$\square$

Find the midrange for the given sample data.
6) A meteorologist records the number of clear days in a given year in each of 21 different U.S.
6) $\qquad$ 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 |

7) $1.5 \quad 2.6 \quad 3.0 \quad 1.0 \quad 1.2 \quad 3.9 \quad 1.8 \quad 3.5 \quad 2.3 \quad 2.8 \quad 1.8$

Find the mean and median for each of the two samples, then compare the two sets of results.
8) The Body Mass Index (BMI) is measured for a random sample of men from two different
8)
7) $\qquad$ colleges. Interpret the results by determining whether there is a difference between the two data sets that is not apparent from a comparison of the measures of center. If there is, what is it?

| Baxter College | 24 | 23.5 | 22 | 27 | 25 | 21.5 | 25 | 24 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Banter College | 19 | 20 | 24 | 25 | 31 | 18 | 29 | 28 |

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

9) A company had 80 employees whose salaries are summarized in the frequency
10) $\qquad$ distribution below. Find the mean salary.

| Salary (\$) | Employees |
| ---: | :---: |
| $5,001-10,000$ | 17 |
| $10,001-15,000$ | 20 |
| $15,001-20,000$ | 12 |
| $20,001-25,000$ | 14 |
| $25,001-30,000$ | 17 |

10) The highway speeds of 100 cars are summarized in the frequency distribution below. Find
11) $\qquad$ the mean speed.

| Speed (mph) | Cars |
| ---: | ---: |
| $30-39$ | 4 |
| $40-49$ | 19 |
| $50-59$ | 50 |
| $60-69$ | 15 |
| $70-79$ | 12 |

## Solve the problem.

11) A student earned grades of $92,79,93$, and 74 on her four regular tests. She earned a grade
12) $\qquad$ of 79 on the final exam and 88 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.
13) Elaine gets quiz grades of 71,75 , and 64 . She gets a 60 on her final exam. Find the weighted
14) mean if the quizzes each count for $20 \%$ and the final exam counts for $40 \%$ of the final grade. Round to one decimal place.

Find the range for the given sample data.
13) Listed below are the amounts of weight change (in pounds) for ten women during their
13) first year of work after graduating from college. Positive values correspond to women who gained weight and negative values correspond to women who lost weight. What is the range?
$\begin{array}{llllllllll}3 & 9 & 5 & 12 & -1 & 24 & 0 & -7 & 7 & -1\end{array}$

Find the variance for the given data. Round your answer to one more decimal place than the original data.
14) Jeanne is currently taking college zoology. The instructor often gives quizzes. On the past
14) $\qquad$ five quizzes, Jeanne got the following scores:
$\begin{array}{llll}17 & 18 & 1 & 20\end{array}$

Find the standard deviation for the given sample data. Round your answer to one more decimal place than is present in the original data.
15) To get the best deal on a CD player, Tom called eight appliance stores and asked the cost of
15) $\qquad$ a specific model. The prices he was quoted are listed below:
$\begin{array}{llllllll}\$ 296 & \$ 111 & \$ 149 & \$ 174 & \$ 347 & \$ 118 & \$ 202 & \$ 110\end{array}$

Find the standard deviation of the data summarized in the given frequency distribution.
16) The test scores of 40 students are summarized in the frequency distribution below. Find the
16) $\qquad$ standard deviation.

| Score | Students |
| :---: | :---: |
| $50-59$ | 5 |
| $60-69$ | 13 |
| $70-79$ | 5 |
| $80-89$ | 8 |
| $90-99$ | 9 |

Use the range rule of thumb to estimate the standard deviation. Round results to the nearest tenth.
17) The heights in feet of people who work in an office are as follows.

$$
\begin{array}{llllllllll}
5.8 & 6.1 & 5.9 & 5.4 & 5.6 & 5.8 & 5.9 & 6.2 & 6.1 & 5.8
\end{array}
$$

18) The race speeds for the top eight cars in a 200 -mile race are listed below.

$$
\begin{array}{llllllll}
185.9 & 179.5 & 189.2 & 176.7 & 175.6 & 188.7 & 186.3 & 177.9
\end{array}
$$

Use the empirical rule to solve the problem.
19) 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 ?
20) At one college, GPA's are normally distributed with a mean of 2.9 and a standard deviation
20) $\qquad$ of 0.6. What percentage of students at the college have a GPA between 2.3 and 3.5?
21) The amount of Jen's monthly phone bill is normally distributed with a mean of $\$ 70$ and a
21) $\qquad$ standard deviation of $\$ 9$. What percentage of her phone bills are between $\$ 43$ and $\$ 97$ ?

Solve the problem. Round results to the nearest hundredth.
22) A department store, on average, has daily sales of $\$ 29,876.76$. The standard deviation of sales is $\$ 1000$. On Tuesday, the store sold $\$ 34,893.71$ worth of goods. Find Tuesday's z score. Was Tuesday an unusually good day?
23) Scores on a test have a mean of 70 and a standard deviation of 11 . Michelle has a score of 48. Convert Michelle's score to a z-score.

Find the number of standard deviations from the mean. Round your answer to two decimal places.
24) In one town, the number of pounds of sugar consumed per person per year has a mean of 8
24) pounds and a standard deviation of 1.7 pounds. Tyler consumed 11 pounds of sugar last year. How many standard deviations from the mean is that?
23) $\qquad$
22) $\qquad$
,

26) A body temperature of $99.5^{\circ} \mathrm{F}$ given that human body temperatures have a mean of $98.20^{\circ}$
26) $\qquad$ $F$ and a standard deviation of $0.62^{\circ}$.

Determine which score corresponds to the higher relative position.
27) Which score has a higher relative position, a score of 38 on a test for which $\bar{x}=27$ and $s=10$, or a score of 262.7 on a test for which $\bar{x}=200$ and $s=57 ?$
28) Which is better: a score of 82 on a test with a mean of 70 and a standard deviation of 8 , or a score of 82 on a test with a mean of 75 and a standard deviation of 4 ?

Find the percentile for the data value.
29) In a data set with a range of 63.5 to 102.3 and 200 observations, there are 138 observations with values less than 89.2. Find the percentile for 89.2.
30) Data set: $\begin{array}{lllllll}55 & 38 & 30 & 66 & 67 & 68 & 44 \text {; }\end{array}$ data value: 55
27) $\qquad$
28) $\qquad$
29) $\qquad$
30) $\qquad$

Find the indicated measure.
31) The test scores of 40 students are listed below. Find $P_{85}$.
31) $\qquad$
$\begin{array}{llllllllll}30 & 35 & 43 & 44 & 47 & 48 & 54 & 55 & 56 & 57\end{array}$
$\begin{array}{llllllllll}59 & 62 & 63 & 65 & 66 & 68 & 69 & 69 & 71 & 72\end{array}$
$\begin{array}{llllllllll}72 & 73 & 74 & 76 & 77 & 77 & 78 & 79 & 80 & 81\end{array}$
$\begin{array}{llllllllll}81 & 82 & 83 & 85 & 89 & 92 & 93 & 94 & 97 & 98\end{array}$
32) The weights (in pounds) of 30 newborn babies are listed below. Find $\mathrm{P}_{16}$.

| 5.5 | 5.7 | 5.8 | 5.9 | 6.1 | 6.1 | 6.4 | 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 |

Construct a boxplot for the given data. Include values of the 5-number summary in all boxplots.
33) The ages of the 35 members of a track and field team are listed below. Construct a boxplot
33) for the data set. Find the IQR. Use the IQR to identify if there are any outliers in the data set $\begin{array}{lllll}15 & 16 & 18 & 18 & 18 \\ 19 & 20\end{array}$ 20202121222223 23242424252526 $\begin{array}{llllll}27 & 27 & 28 & 29 & 29 & 30 \\ 31\end{array}$ 31333435394248

## MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use the side-by-side boxplots below to answer the question. The boxplots summarize the number of sentenced prisoners by state in the Midwest and West.

Midwest

34) Pick the statement that best describes the shape of the distribution for the states in the West.
A) The data appears to be right-skewed with a possible outlier.
B) The data appears to be left-skewed with large variability.
C) The data appears to be roughly symmetrical with a possible outlier.
35) Based on the boxplot for the Midwest, which of the following is true?
A) $25 \%$ of the states sentenced more than 29,928 prisoners.
B) $50 \%$ of the states sentenced more than 29,928 prisoners.
C) $50 \%$ of the states sentenced less than 4,322 prisoners.
D) $25 \%$ of the states sentenced less than 1,435 prisoners.
36) Using the boxplot for the Midwest, determine which of the following statements about the $\qquad$ distribution cannot be justified.
A) There are fewer states with 3887.5 to 6887 prisoners than states with 6887 to 15,706 prisoners.
B) The range is 32,467 .
C) About $75 \%$ of the West states had 3,887 or more prisoners.
D) The distribution is skewed to the right.
37) Pick the statement that best describes the shape of the distribution for the states in the Midwest.
34) $\qquad$
35) $\qquad$
37) $\qquad$
A) The data appears to be left-skewed with large variability.
B) The data appears to be right-skewed with a possible outlier.
C) The data appears to be right-skewed with large variability.
D) The data appears to be roughly symmetrical with a possible outlier.
38) Based on the boxplot for the West, which of the following is true?
38) $\qquad$
A) $25 \%$ of the states sentenced more than 15,706 prisoners.
B) $50 \%$ of the states sentenced less than 15,706 prisoners.
C) $50 \%$ of the states sentenced less than 22,662 prisoners.
D) $25 \%$ of the states sentenced less than 3,888 prisoners.
39) Using the boxplot for the West, determine which of the following statements about the distribution
cannot be justified.
A) The distribution is skewed to the right.
B) About $75 \%$ of the West states had 3,887 or more prisoners.
C) There are fewer states with 3887.5 to 6887 prisoners than states with 6887 to 15,706 prisoners.
D) The range is 32,467 .
E) The interquartile range is about 11,819 .

## Answer Key

Testname: CH_3_WKSHT

1) 4.88 hr
2) 25.5 months
3) 72
4) $4.9 \mathrm{oz}, 4.2 \mathrm{oz}$
5) 66
6) 110.5 days
7) 2.45
8) Baxter College: mean $=24$; median $=24$

Banter College: mean $=24.25$; median $=24.5$
Even though the measures of center are roughly the same, the Banter College values are much more varied than the Baxter College values.
9) $\$ 17,125.00$
10) 55.7 mph
11) 83.7
12) 66.0
13) 31 lb
14) 57.7
15) $\$ 89.3$
16) 14
17) 0.2
18) 3.4
19) $95 \%$
20) $68 \%$
21) $99.7 \%$
22) 5.02 , yes
23) -2
24) 1.76 standard deviations above the mean
25) -1.8 ; not unusual
26) 2.1; unusual
27) Both scores have the same relative position.
28) The second 82
29) 69
30) 43
31) 87
32) 6.1 lb
33)

34) A
35) A
36) A
37) C
38) A
39) C

