Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

1. In an editorial, the *Poughkeepsie Journal* printed this statement: "The median price − the price exactly in between the highest and lowest − ..." Does this statement correctly describe the median? Why or why not?

Choose the correct answer below.

- ○ A. No. It describes the mode, not the median.
- ○ B. No. It describes the mean, not the median.
- ○ C. Yes. It correctly describes the median.
- ○ D. No. It describes the midrange, not the median.

2. A simple random sample of pages from a particular dictionary was obtained. Listed below are the numbers of words defined on those pages. Find the (a) mean, (b) median, (c) mode, and (d) midrange for the given sample data. Given that this dictionary has 1,493 pages with defined words, estimate the total number of defined words in the dictionary. Is that estimate likely to be an accurate estimate of the number of words in the English language?

48 66 35 40 29 64 74 41 51 82

a. The mean is ☐ words per page.
(Type an integer or a decimal.)

b. The median is ☐ words per page.
(Type an integer or a decimal.)

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

- ○ A. The mode is ☐ words per page.
  (Use a comma to separate answers as needed.)
- ○ B. There is no mode.

d. The midrange is ☐ words per page.
(Type an integer or a decimal.)

The estimated number of words in the dictionary is ☐.
(Round to the nearest whole number as needed.)

Is the estimate likely to be an accurate estimate of the number of words in the English language?

- ○ A. No, because the mean is not sensitive to extreme variations in sample values
- ○ B. Yes, because the mean is a relatively reliable and more consistent measure of center
- ○ C. No, because the mean is based on a small sample that has large variations among its values
- ○ D. Yes, because the mean is relatively reliable even with small samples

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

3. 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?

2 4 1 1 1 1 4 4 3 3 1 4 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. All the measures of center make sense since the data is numerical.
- ○B. Only the mean, median, and midrange make sense since the data is nominal.
- ○C. Only the mean, median, and mode make sense since the data is numerical.
- ○D. Only the mode makes sense since the data is nominal.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

4. Listed below are the durations (in hours) of a simple random sample of all flights of a space shuttle. Find the (a) mean, (b) median, (c) mode, and (d) midrange for the given sample data. Is there a duration time that is very unusual? How might that duration time be explained?

76 97 235 189 170 258 186 381 260 235 383 329 224 244 0

a. The mean is ☐ hours.
(Round to one decimal place as needed.)

b. The median is ☐ hours.
(Round to one decimal place as needed.)

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

- ○A. The mode is ■ hours.
  (Use a comma to separate answers as needed. Round to one decimal place as needed.)
- ○B. There is no mode.

d. The midrange is ☐ hours.
(Round to one decimal place as needed.)

Is there a duration time that is very unusual? How might that duration time be explained?

- ○A. No, the flights have usual duration times ranging from 0 to over 375 hours.
- ○B. No, there is no flight with an unusual duration time.
- ○C. Yes, the time of more than 375 hours is very unusual. It could represent a very long flight.
- ○D. Yes, the time of 0 hours is very unusual. It could represent a flight that was aborted.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

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

Fourteen different second-year medical students measured the blood pressure of the same person. The systolic readings (in mmHg) are listed below.

139 120 147 128 128 128 142 142 124 144 120 136 143 128

(a) The mean blood pressure reading is ☐ mmHg.
(Round to the nearest tenth as needed.)

(b) The median blood pressure reading is ☐ mmHg.
(Round to the nearest tenth as needed.)

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

○A. The mode blood pressure reading is ☐ mmHg.
(Use a comma to separate answers as needed.)

○B. There is no mode.

(d) The midrange of the data set is ☐ mmHg.
(Round to the nearest tenth as needed.)

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

6. Pennies made before 1983 are 97% copper and 3% zinc, whereas pennies made after 1983 are 3% copper and 97% zinc. Listed below are the weights (in grams) of pennies from each of the two time periods. Find the mean and median for each of the two samples, then compare the two sets of results.

Before 1983:	3.1041	3.1273	3.1033	3.0776	3.1583	3.1089
After 1983:	2.4995	2.4841	2.4829	2.5025	2.4952	2.4903

The mean weight of the pennies made before 1983 is ☐ grams.
(Round to four decimal places as needed.)

The median weight of the pennies made before 1983 is ☐ grams.
(Type an exact answer.)

The mean weight of the pennies made after 1983 is ☐ grams.
(Round to four decimal places as needed.)

The median weight of the pennies made after 1983 is ☐ grams.
(Type an exact answer.)

Does there appear to be a considerable difference in the means?

- ○ A. No, because the difference in the means is less than 5%.
- ○ B. Yes, because the difference in the means is less than 5%.
- ○ C. Yes, because the difference in the means is more than 5%.
- ○ D. No, because the difference in the means is more than 5%.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

7. 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	6.6	6.7	7.1	7.2	7.5	7.8	7.8	7.8
Individual Lines	4.1	5.3	5.8	6.1	6.7	7.6	7.8	8.6	9.3	10.1

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.
- ○ B. The times for customers in individual lines are much more varied.
- ○ C. There is no difference between the two data sets.

8. Find the mean of the data summarized in the given frequency distribution. Compare the computed mean to the actual mean of 52.2 degrees.

Low Temperature (°F)	40 – 44	45 – 49	50 – 54	55 – 59	60 – 64
Frequency	2	4	10	7	2

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 not close to the actual mean because the difference between the means is more than 5%.
- ○ B. The computed mean is close to the actual mean because the difference between the means is more than 5%.
- ○ C. The computed mean is not close to the actual mean because the difference between the means is less than 5%.
- ○ D. The computed mean is close to the actual mean because the difference between the means is less than 5%.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

9. A student earned grades of B, C, A, C, and B. Those courses had the corresponding numbers of credit hours 3, 3, 3, 2, and 1. The grading system assigns quality points to letter grades as follows: A = 4; B = 3; C = 2; D = 1; F = 0. Compute the grade point average (GPA) as a weighted mean and round the result with two decimal places. If the Dean's list requires a GPA of 3.00 or greater, did this student make the Dean's list?

The grade point average is ☐.
(Round to two decimal places as needed.)

Did this student make the Dean's list?

- ○ A. Yes because at least two of the student grades are B or above
- ○ B. No because the student has at least one grade less than 3
- ○ C. No because the student's GPA is less than 3.0
- ○ D. No because the students GPA is not 4.0

10. The systolic blood pressures of 40 women have a mean of 110.8 mm Hg and a standard deviation of 17.1 mm Hg. The highest systolic blood pressure measurement in this sample is 181 mm Hg. In this context, is a systolic blood pressure of 181 mm Hg "unusual"? Why or why not?

Choose the correct answer below.

- ○ A. Yes, because it differs from the mean by more than two standard deviations.
- ○ B. No, because it does not differ from the mean by more than two standard deviations.
- ○ C. No, because it does not differ from the mean by more than one standard deviation.
- ○ D. Yes, because it differs from the mean by more than one standard deviation.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

11. Statistics students participated in an experiment to test their ability to determine when 1 minute (or 60 seconds) has passed. The results are given below in seconds. Find the range, variance, and standard deviation for the given sample data. Identify one reason why the standard deviation from this sample might not be a good estimate of the standard deviation for the population of adults.

53 54 60 67 59

Range = ☐ sec

Sample variance = ☐ sec^2 (Round to the nearest tenth as needed.)

Sample standard deviation = ☐ sec (Round to the nearest tenth as needed.)

Identify one reason why the standard deviation from this sample might not be a good estimate of the standard deviation for the population of adults.

- ○A. The standard deviation might not be a good estimate, because the standard deviation is too large.
- ○B. The standard deviation might not be a good estimate, because the sample is very small.
- ○C. The standard deviation might not be a good estimate, because there is most likely an outlier in the sample data.
- ○D. The standard deviation might not be a good estimate, because the data are from a random sample.

12. Listed below are the durations (in hours) of a simple random sample of all flights of a space shuttle program. Find the range, variance, and standard deviation for the sample data. Is the lowest duration time unusual? Why or why not?

71 98 235 191 160 266 192 373 260 238 380 337 224 241 0

The range of the sample data is ☐ hours. (Type an integer or adecimal.)

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

The standard deviation of the sample data is ☐ hours.
(Round to three decimal places as needed.)

Is the lowest duration time unusual? Why or why not?

- ○A. No, because the sample is random.
- ○B. Yes, because it is more that two standard deviations below the mean.
- ○C. Yes, because the lowest value in a data set is usually an outlier.
- ○D. No, because it is within two standard deviations of the mean.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

13. Listed below are the thorax lengths (in millimeters) of a sample of male fruit flies. Find the range, variance, and standard deviation for the given sample data. If the listed measurements were obtained from fruit flies in a particular city in a country, does the standard deviation serve as a reasonable estimate of the standard deviation for all fruit flies residing in that country?

0.85 0.66 0.68 0.67 0.82 0.69 0.72 0.68 0.87 0.83 0.75

Range = ☐ mm

Sample variance = ☐ mm^2 (Round to three decimal places as needed.)

Sample standard deviation = ☐ mm
(Do not round until the final answer. Then round to three decimal places as needed.)

Does the standard deviation serve as a reasonable estimate of the standard deviation for all fruit flies residing in the country?

- ○ A. The estimate is not reasonable because there is most likely an outlier in the sample data.
- ○ B. The estimate is reasonable because the sample is random.
- ○ C. The estimate is reasonable because standard deviation is an unbiased estimator.
- ○ D. The estimate is not reasonable because the sample is not representative of the whole population.

14. Listed below are costs (in dollars) of roundtrip flights between two cities. All flights involve one stop and a two-week stay. Find the coefficient of variation for each of the two sets of data, then compare the variation.

30 Days in Advance: 264 260 268 317 294 288 300
1 Day in Advance: 454 629 567 972 629 1013 534

The coefficient of variation for the prices of tickets purchased 30 days in advance is ☐ %.(Round to three decimal places as needed.)

The coefficient of variation for the prices of tickets purchased 1 day in advance is ☐ %.(Round to three decimal places as needed.)

Is there a difference in variation between the two data sets?

- ○ A. The costs of tickets purchased 1 day in advance have less variation than the costs of tickets purchased 30 days in advance.
- ○ B. The costs of tickets purchased 30 days in advance have less variation than the costs of tickets purchased 1 day in advance.
- ○ C. There is no significant difference in the variation.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

15. Waiting times (in minutes) of customers at 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 coefficient of variation for each of the two sets of data, then compare the variation.

Bank A (single line):	6.5	6.6	6.8	6.8	7.2	7.3	7.3	7.6	7.6	7.8
Bank B (individual lines):	4.0	5.4	5.8	6.1	6.7	7.8	7.8	8.6	9.3	9.8

The coefficient of variation for the waiting times at Bank A is ☐%.
(Round to three decimal places as needed.)

The coefficient of variation for the waiting times at the Bank B is ☐%.
(Round to three decimal places as needed.)

Is there a difference in variation between the two data sets?

- ○ A. There is no significant difference in the variations.
- ○ B. The waiting times at Bank B have considerably less variation than the waiting times at Bank A.
- ○ C. The waiting times at Bank A have considerably less variation than the waiting times at Bank B.

16. Find the standard deviation of sample data summarized in a frequency distribution table by using the formula below, where x represents the class midpoint and f represents the class frequency.

$$s = \sqrt{\frac{n[\sum (f \cdot x^2)] - [\sum (f \cdot x)]^2}{n(n-1)}}$$ standard deviation for frequency distribution

Daily Low Temp (°F)	30 – 34	35 – 39	40 – 44	45 – 49	50 – 54	55 – 59
Frequency	2	3	5	10	5	1

s = ☐°F (Round to one decimal place as needed.)

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

17. The mean of electrical energy consumption amounts for a home during a two-month period is 2579 kWh, and the standard deviation is 551 kWh. Use the range rule of thumb to identify minimum and maximum "usual" amounts of electrical energy consumption. For one particular two-month period, the power company recorded consumption of 1507 kWh. Is that amount unusual?

minimum "usual" value = ☐ kWh

maximum "usual" value = ☐ kWh

Is 1507 kWh an unusual amount of consumption?

- ○ A. Yes, because it is larger than the maximum usual value.
- ○ B. No, because it is between the minimum and maximum usual values.
- ○ C. Yes, because it is between the minimum and maximum values.
- ○ D. Yes, because it is smaller than the minimum usual value.

18. Heights of men on a baseball team have a bell-shaped distribution with a mean of 178 cm and a standard deviation of 7 cm. Using the empirical rule, what is the approximate percentage of the men between the following values?
a. 164 cm and 192 cm
b. 157 cm and 199 cm

a. ☐ % of the men are between 164 cm and 192 cm.

b. ☐ % of the men are between 157 cm and 199 cm.

19. Heights of women have a bell-shaped distribution with a mean of 161 cm and a standard deviation of 5 cm. Using Chebyshev's theorem, what do we know about the percentage of women with heights that are within 3 standard deviations of the mean? What are the minimum and maximum heights that are within 3 standard deviations of the mean?

At least ☐ % of women have heights within 3 standard deviations of 161 cm.
(Round to the nearest percent as needed.)

The minimum height that is within 3 standard deviations of the mean is ☐ cm.

The maximum height that is within 3 standard deviations of the mean is ☐ cm.

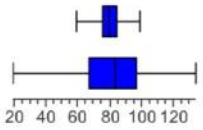
Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

20. A set of data consists of the heights of presidents of the United States, measured in centimeters. If the height of President Kennedy is converted to a z score, what unit is used for the z score?

Choose the correct answer below.

- ○ A. The z score will use cm for the units.
- ○ B. The z score will use cm^2 for the units.
- ○ C. The z score will use cm^3 for the units.
- ○ D. z scores have no units.

21. The two boxplots correspond to the service times from two different companies that repair air conditioning units. They are drawn on the same scale. The top boxplot corresponds to Qool Air, Inc., and the bottom boxplot corresponds to the Fresh Air company. Which company has less variation in repair times? Which company should have more predictable costs?



Choose the correct answer below.

- ○ A. Fresh has less variation. Because Fresh has less variation, estimates of repair costs will tend to be less accurate. Thus, Qool will have more predictable costs.
- ○ B. Qool has less variation. Because Qool has less variation, estimates of repair costs will tend to be more accurate, so the costs will tend to be more predictable.
- ○ C. Qool has less variation. Because Qool has less variation, estimates of repair costs will tend to be less accurate. Thus, Fresh will have more predictable costs.
- ○ D. Fresh has less variation. Because Fresh has less variation, estimates of repair costs will tend to be more accurate, so the costs will tend to be more predictable.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

22. With a height of 60 in, Vincent was the shortest president of a particular club in the past century. The club presidents of the past century have a mean height of 73.6 in and a standard deviation of 2.7 in.

a. What is the difference between Vincent's height and the mean?

b. How many standard deviations is that [the difference found in part (a)]?

c. Convert Vincent's height to a z score.

d. If we consider "usual" heights to be those that convert to z scores between -2 and 2, is Vincent's height usual or unusual?

a. The difference between Vincent's height and the mean is ☐ in.

b. The difference is ☐ standard deviations.
(Type an integer or decimal rounded to two decimal places as needed.)

c. The z score is ☐.
(Type an integer or decimal rounded to two decimal places as needed.)

d. Is Vincent's height usual or unusual?

- ○ Usual
- ○ Unusual

23. A certain animal's body temperature has a mean of 91.75°F and a standard deviation of 0.71°F. Convert the given temperatures to z scores.

a. 90.55°F **b.** 92.35°F **c.** 91.75°F

a. z = ☐ (Type an integer or decimal rounded to two decimal places as needed.)

b. z = ☐ (Type an integer or decimal rounded to two decimal places as needed.)

c. z = ☐ (Type an integer or decimal rounded to two decimal places as needed.)

24. A woman wrote to a newspaper advice columnist and claimed that she gave birth 308 days after a visit from her husband, who was in the Navy. Lengths of pregnancies have a mean of 268.1 days and a standard deviation of 14.6 days. Find the z score for 308 days. Is such a length unusual?

The z score is ☐. (Round to two decimal places as needed.)

Is a pregnancy length of 308 days unusual?

- ○A. No, because its corresponding z score is less than 2.
- ○B. Yes, because its corresponding z score is greater than 2.
- ○C. No, because its corresponding z score is greater than 2.
- ○D. Yes, because its corresponding z score is less than 2.

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

25. Which is relatively better: a score of 91 on a psychology test or a score of 21 on an economics test? Scores on the psychology test have a mean of 92 and a standard deviation of 15. Scores on the economics test have a mean of 46 and a standard deviation of 10.

Choose the correct answer below.

- ○ A. The psychology test score is relatively better because its z score is less than the z score for the economics test score.
- ○ B. The psychology test score is relatively better because its z score is greater than the z score for the economics test score.
- ○ C. The economics test score is relatively better because its z score is greater than the z score for the psychology test score.
- ○ D. The economics test score is relatively better because its z score is less than the z score for the psychology test score.

26. Below are 36 sorted ages of an acting award winner. Find the percentile corresponding to age 80 using the method presented in the textbook.

16	17	22	23	24	29	32	35	35	36
39	40	42	45	46	48	49	50	50	53
55	57	58	62	64	68	71	74	76	76
77	77	78	80	80	80				

percentile of value 80 = ☐ (Round to the nearest integer as needed.)

27. Below are 36 sorted ages of an acting award winner. Find P_{10} using the method presented in the textbook.

17	19	20	20	21	22	28	29	29	31
31	31	32	32	34	36	40	40	45	48
53	55	58	59	60	62	64	64	67	68
68	70	73	74	76	79				

P_{10} = ☐

28. Find the third quartile Q_3 of the list of 24 sorted values shown below.

30 31 34 38 39 40 41 43 45 48 50 51 52 52 53 58 60 64 66 71 74 74 79 79

The third quartile Q_3 is ☐. (Simplify your answer.)

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

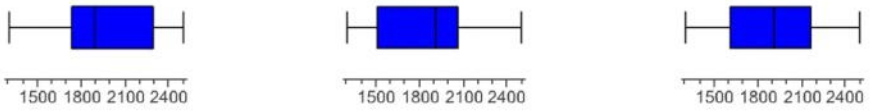
29. The data listed below represent the yield for regular corn seed. Find the 5-number summary and construct a boxplot.

2119 1510 1897 2065 1908 1936 1626 2496 1969 1445 1301

The 5-number summary is ☐, ☐, ☐, ☐, ☐.
(Type exact answers. Use ascending order.)

Choose the correct boxplot of the data below.

○A. ○B. ○C.



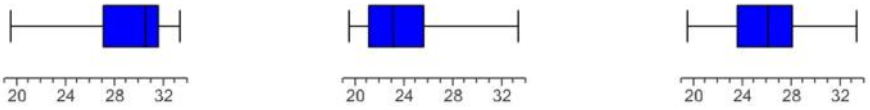
30. The data below indicate the body mass index (BMI) values of 20 males. Find the 5-number summary and construct a boxplot.

30.4 26.3 25.9 33.4 25.3 20.7 24.2 26.9 26.7 27.1
22.6 19.5 28.5 24.7 32.2 27.8 23.8 23.4 21.5 32.8

The 5-number summary is ☐, ☐, ☐, ☐, ☐.
(Type exact answers. Use ascending order.)

Choose the correct boxplot of the data below.

○A. ○B. ○C.



Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 3
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

31. Instead of considering a data value to be an outlier if it is "very far away from almost all of the other data values," consider an outlier to be a value that is above Q_3 by an amount greater than 1.5 × IQR or below Q_1 by an amount greater than 1.5 × IQR. Use the data set given below to find (a) the 5-number summary, (b) the interquartile range (IQR), and (c) any outliers.

3 4 5 6 8 11 14 15 15 18 19 36 53

a. The 5-number summary is ☐, ☐, ☐, ☐, ☐.
(Type exact answers. Use ascending order.)

b. The interquartile range is ☐.

c. The outliers are ☐.
(Use a comma to separate answers as needed.)