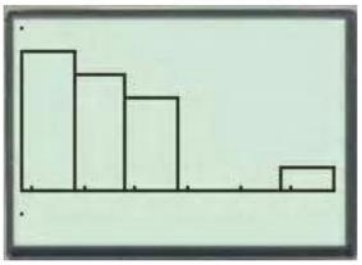
Thursday, October 19, 2017
5:52 PM

KEY

Statistics H - Chapter 1 Test Review

1. Decide whether each statement is true or false about the histogram below.

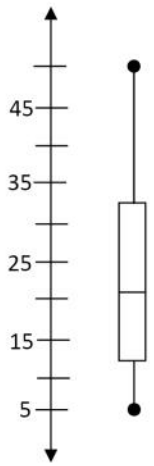


a. The histogram is skewed right. true
b. The histogram appears to have an outlier. true
c. The histogram is symmetric. False
d. The histogram is bimodal. False
e. The median falls in the last class on the right. False

2. State whether each variable is quantitative or categorical.

a. Person's weight quantitative
b. Salary quantitative
c. Monthly water bill quantitative
d. Driver's license # categorical
e. Area code categorical
f. Football position categorical
g. Model of a car categorical
h. Car's gas mileage quantitative

3.



The box plot to the left shows the test grades of 60 students on a 50 point test. Fill in the blanks below.

a. The highest test score is 50 out of 50.
b. The median test score is about 21 out of 50.
c. The data is skewed Right.
d. The range is about from 5 to 50 or 45. (50-45)

4. What happens to the standard deviation as the spread decreases? std. dev. decreases

5. What does it mean if you have a standard deviation of zero? there is no spread, so all of the numbers are the same.

6. What does it mean if you have a variance of zero? same as #5.

7. Are the following measures affected by an extreme outlier? Write yes or no in the space.

a. Mean yes
b. Median NO
c. Mode NO
d. IQR NO

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* sort 1st !

8. Find the median of the data: 11 12 29 36 63 86 89 94 59

Median = 59 — 11 12 29 36 59 63 86 89 94

9. The standard deviation of the data in #8 is 32.6182. If a constant of 5 is added to all of the data, what would the new $\bar{x} = 53.2222 + 5$

a. mean be? $\bar{x} = 58.2222$

b. standard deviation be? $S_x = 32.6182$ (no change)

10. The mean of the data in #8 is 53.2222. If a constant of 5 is multiplied to all of the data, what would the new

a. mean be? $\bar{x} = 266.111$ (53.2222 x 5)

b. standard deviation be? $S_x = 163.091$ (32.6182 x 5)

11. A sample that has a larger variance, has a larger spread.

a. Mean **b.** Median **c.** Spread **d.** Outlier

b.

12.

Temperature (Fahrenheit)	Days
50-60°	10
60-70°	308
70-80°	1519
80-90°	1626 ← 3877 ÷ 2 = 1938.5th entry
90-100°	403
100-110°	11

Source: NOAA

total 3877

Label each statement with "true" or "false".

a. The data is roughly symmetric. TRUE

b. The median is 80 - 90 degrees. TRUE

c. There appears to be one outlier. False

13. How do we find range? Maximum - minimum IQR? Q3 - Q1

OR min. to max.

14. Find the five number summary for the data in the stemplot.

10	0 0 2 9
11	0 1 1 3 4 4 4 6 9
12	0 0 3 4 4 5 5 5 6 6 6 6
13	0 1 3 3 4 4 5 6 7 7 9 9 9
14	2 3 4 5 5
15	2 3 7 9

Key: 15 | 2 means 152

min = 100
Q1 = 116
Median = 126
Q3 = 139
max = 159

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15. Roger Maris had these homerun totals in 10 years in the American League:

13 23 26 16 33 61 28 39 14 8

a. What is the mean of the data? $\bar{x} = \frac{\sum x_i}{n} = \frac{261}{10} = 26.1$ *

b. What is the IQR of the data? $Q3 - Q1 = 33 - 14 = 19$

c. What is the standard deviation of the data? $S_x = 15.6095$

* $S_x = \sqrt{\frac{1}{n-1}\sum (x_i - \bar{x}_n)^2} = \sqrt{\frac{1}{9}(2192.9)} = \sqrt{243.655}$

* If asked to show calculation

16. If you are given data that is skewed…

a. What is the best measure of center to use? Median

b. What is the best measure of spread to use? IQR

c. What is the best graph to use to display the data? Box plot

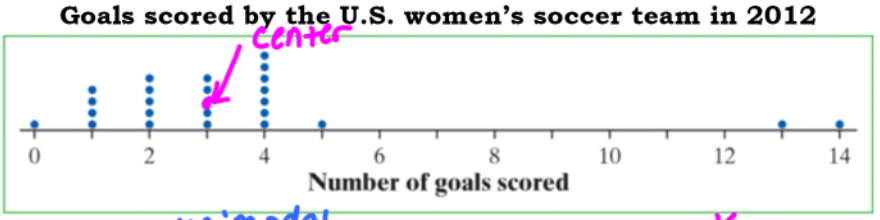
17. If you are given data that is perfectly symmetric…

a. What is the best measure of center to use? mean

b. What is the best measure of spread to use? standard deviation

c. What is the best graph to use to display the data? Histogram

18. Use the dotplot below to answer the following questions.



a. What is the shape? unimodal, skewed right **b.** What is the center? * 3

c. What is spread? 0 to 14 or 14 **d.** Do there appear to be any outliers? 13 + 14 appear to be.

e. What does the graph tell you? In a typical game the women scored 3 goals, however there were two outstanding games with 13 & 14 goals scored.

* 25 entries, $\frac{25+1}{2}$ = 13th entry = 3

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19. If you are given data that has one outlier…

a. What is the best measure of center to use? Median

b. What is the best measure of spread to use? IQR

c. What is the best graph to use to display the data? Box plot

20. In 1798, the English scientist Henry Cavendish measured the density of the earth several times by careful work with a torsion balance. The variable recorded was the density of the earth as a multiple of the density of water. Here are Cavendish's 29 measurements:
Remember that a leaf can only be one digit!

5.50	5.61	4.88	5.07	5.26	5.55	5.36	5.29	5.58	5.65
5.57	5.53	5.62	5.29	5.44	5.34	5.79	5.10	5.27	5.39
5.42	5.47	5.63	5.34	5.46	5.30	5.75	5.68	5.85	

a. Present these measurements graphically in a stemplot.

Density of Earth as a multiple of Density of water

48	8
49	
50	7
51	0
52	6 7 9 9
53	0 4 4 6 9
54	2 4 6 7
55	0 3 5 7 8
56	1 2 3 5 8
57	5 9
58	5

Key: 48|8 = 4.88

b. Discuss the distribution of your graph. *Show all calculations.*

Shape: unimodal, skewed left

Outliers: none

Center: Median = 5.46

Spread: 4.88 to 5.85

c. What is your estimate of the density of the earth based on these measurements? Explain.

The median of 5.46 is the best estimate since the data is skewed.