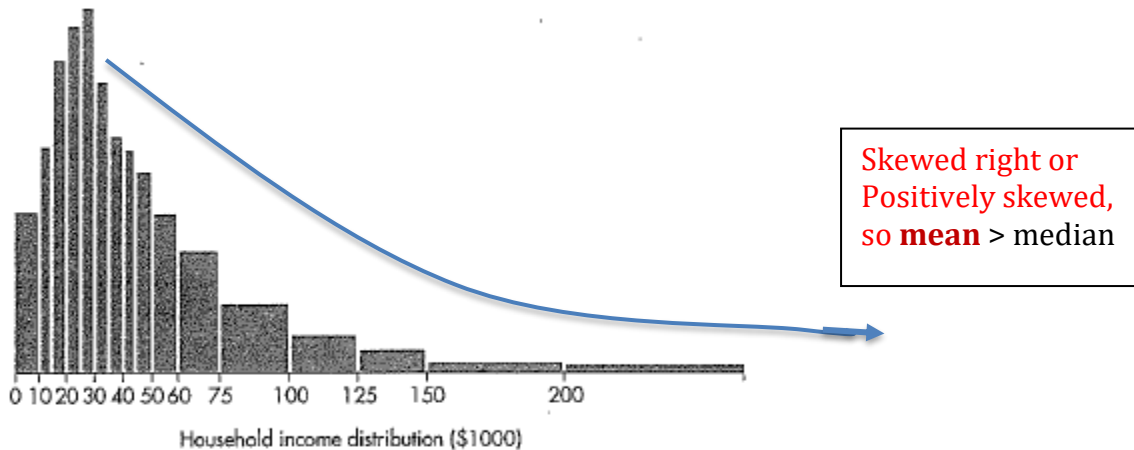


HW # 8 TEST REVIEW **ANSWERS** - AP Stats: Chapters 1 - 3

1. The two major branches of statistics are:
Descriptive and inferential statistics

2.

The graph below shows household income in Laguna Woods, California.



What can be said about the ratio $\frac{\text{Mean family income}}{\text{Median family income}}$?

- A. Approximately zero
B. Less than one, but definitely greater than zero
C. Approximately one
D. Greater than one
E. Cannot be determined without knowing the standard deviation
3. Which of the following is a qualitative variable?
I. The mean income of teachers in Kentucky.
II. The volume of fat in desserts available at a restaurant.
III. The different ethnicities of students at Manual.
A. I only B. II only **C. III only** D. I and III E. II and III
4. What is the symbol for the sample mean?
A. **\bar{x}** B. \bar{s} C. μ D. σ E. n

5. If in a sample of $n = 100$, the frequency of a histogram class interval of width 10 is 22, then the density of this class interval is:

- A. 0.22 **B. 0.022** C. 4.4 D. 0.044 E. 0.909

6. What is bias in conducting surveys? **A systematic undercoverage or overcoverage of desired population**

Selection bias

Response bias

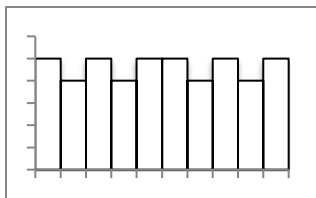
Non-response bias

7. Which of the following graphical methods cannot be used on a categorical data set?

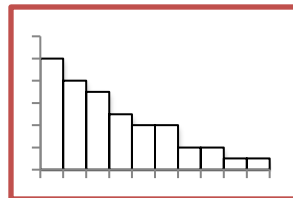
- A. Bar chart
B. Pie chart
C. Stem-and-leaf plot
D. Segmented bar chart
E. All of these methods can be used on a categorical data set.

8. In which of the following histograms is the mean greater than the median?

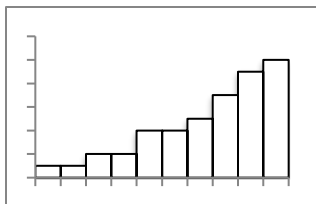
A.



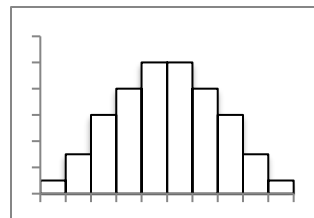
B.



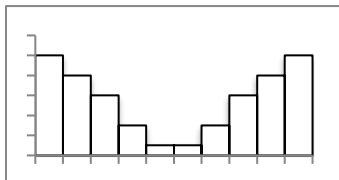
C.



D.



E.



9. Which of the following is not a measure of the center of a data set?

- A. Range B. Mode C. Median D. Mean

10. Which of the following numerical variables are continuous?

- I. The number of jelly beans in a jar.
- II. The ages of a group of students.
- III. The humidity in Atlanta.
- IV. The number of ways to select a committee of three from a group of ten.
- V. The lengths of fish caught on a sport fishing trip.

- A. II only B. III only C. IV and V D. III and V E. II, III, and V

11. When is a data value called an outlier?

A value that is much larger or much smaller than the majority of the data values.

12. A study of voting chose 663 registered voters at random shortly after an election. Of these, 56% said they had voted in the election. Election records show that only 61% of registered voters voted in the election. Which of the following states is true about this situation?

- A. 61% is a sample, 56% is a population
- B. 61% and 56% are both statistics
- C. 61% is a statistic and 56% is a parameter
- D. 61% is a parameter and 56% is a statistic
- E. 61% and 56% are both parameters

13. What are the measures of variability in a data set?

Range, interquartile range, standard deviation, and variance

14. You wish to survey the people who have brought in their cars for service during the past month. You decide to pick a random sample of gas stations in the city and then survey all customers from those stations who had work done during the past month. This procedure is an example of which type of sampling?

Cluster sampling

15. The transportation department of a large city wants to estimate the proportion of residents who would use a system of aerial gondolas to commute to work. The gondolas would be part of the city's effort to relieve traffic congestion. The department asked a random sample of residents whether they would use the gondolas. The residents could respond with yes, no, or maybe. Which of the following is the best description of the method for data collection used by the department?
- A. A census
 - B. A sample survey
 - C. An experiment with a completely randomized design
 - D. An experiment with a randomized block design
 - E. An experiment with a matched-pairs design

16. What is the first step of the data analysis process?

Understand the problem

17. What are the two main types of data in statistics?

Categorical and numerical
(or *qualitative and quantitative*)

18. What is the symbol for the sample size?

A. \bar{x} B. \bar{s} C. μ D. σ E. n

19. A sales representative wishes to survey her client base of 47 companies. She has 47 business cards, all of the identical size, from her contacts in the companies, and decides to drop them all in a small box, shake them up, and reach in to pick 5 cards for her sample. This procedure is an example of which type of sampling?

A. Cluster
B. Convenience
C. Simple random
D. Stratified
E. Systematic

20. What is the symbol for the population mean?

A. \bar{x} B. \bar{s} C. μ D. σ E. $\bar{\sigma}$

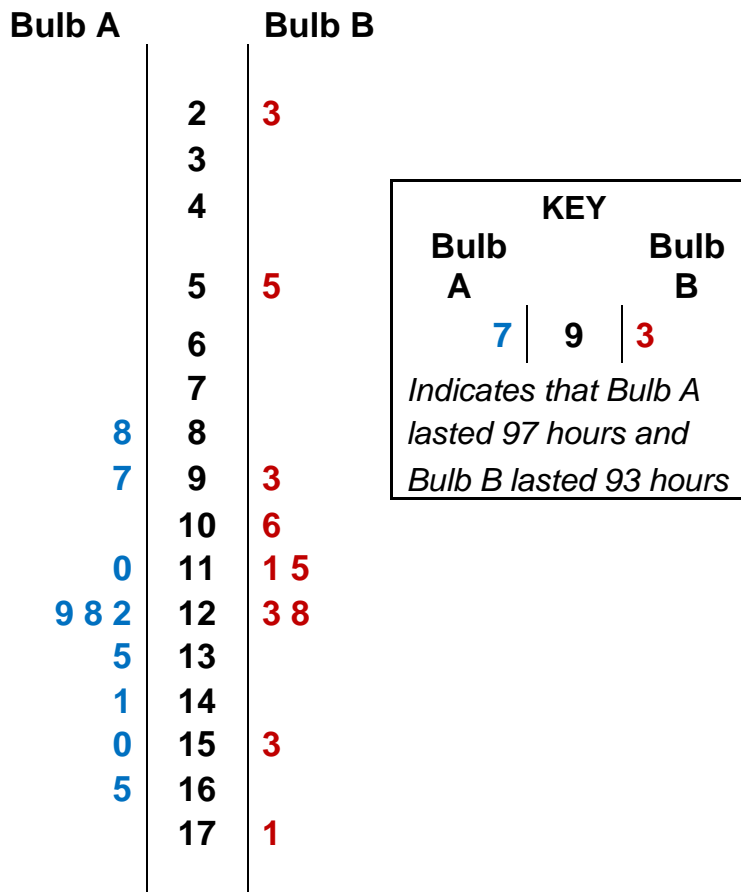
Test Review Free Reponse: __KEY__Open-ended Question

1. An experiment was performed to determine which brand of comparably priced light bulbs, A or B, lasts longer on average. Ten bulbs of each brand were tested, and their lifetimes recorded in hours. The data are shown below:

Bulb A: 88, 97, 110, 122, 128, 129, 135, 141, 150, 165

Bulb B: 23, 55, 93, 106, 111, 115, 123, 128, 153, 171

- a) Display these data using a comparative (back-to-back) stem plot. (5 points)



- b) What are the differences and similarities in the lifetime distributions for the two samples?

Bulb A has a median of 128.5 hours and a mean of 126.5 hours, with a range of 77 hours.

Bulb B has a median of 113 and a mean of 107.8, with a range of 148 hours.

70% of the observations for **Bulb A** lasted longer than 120 hours, while only 40% of the observations for Bulb B lasted longer than

120 hours. The shortest lifetime for Bulb A was 88 hours, while the shortest for bulb B was 23 hours.

- c) *If your preference for brand A or B must be determined from the information in parts a) and b), which brand would you buy? Explain your choice using appropriate statistical values for SOCS. (6 points)*

Bulb A is a better choice because...

Bulb A is definitely a better choice because there is less variability in the lifetime of the bulbs, and the average lifetime was about 10 hours longer compared to the sample of bulbs from B.

