AP Statistics- Summer Assignment


Part II: Please read the Chapter 1 Introduction, Section 1.1, Section 1.2, and Section 1.3. After you finish the reading, please complete the following problems on the attached sheet of paper:

- Check Your Understanding: Page 5
- Check Your Understanding: Page 18
- Check Your Understanding: Page 29
- Check Your Understanding: Page 59

Part III: Complete the Chapter 1 Multiple Choice Questions on the packet attached. The final answers should be written on the answer sheet, which can be found on the last page.

Part IV: Vocabulary – Use your textbook to find and write the definitions for each of the vocabulary words for Chapter 1 in your binder. They don’t have to be long definitions, just the ‘key idea’. This will not be collected and will be important to have in your binder.

- Individuals
- Variable
- Categorical variable
- Quantitative variable
- Distribution
- Frequency
- Frequency table
- Relative frequency table
- Roundoff error
- Pie chart
- Bar graph
- Two way table
- Marginal distribution
- Conditional distribution
- Segmented bar graph
- Association
- Dotplot
- Range
- Symmetric distribution
- Skewed left distribution
- Skewed right distribution
- Shape
- Spread
- Center
- Outlier
- Bi modal
- Multi modal
- Stemplot
- Splitting stems
- Back to back stemplot
- Histogram
- Mean
- $\bar{x}$
- Median
- Quartiles
- $Q_1$ and $Q_3$
- Range
- Quartiles
- Interquartile range
- Five number summary
- Boxplot
- Standard deviation
- Variance
- Resistant
- Nonresistant

Part V: Supplies - Extra Large Book Cover, a three-ring binder (3 in.), enough tabbed separators for 12 chapters, lined paper, pencils, highlighters, a good attitude and a competitive spirit.

Part VI: Google Classroom – Sign up on Google Classroom for the AP Statistics Classroom. The code is: fezm3q
AP Statistics Summer Assignment 2019-2020

A TI-89 calculator may be used on Part II and Part III of the summer assignment. Working with other students entering AP Statistics is encouraged and acceptable; however, working with a tutor is not acceptable.

The suggested due date for the above material is Monday, August 12th in Miss Heerwagen’s mailbox in the main office at RFH. No points will be deducted for turning it in on the first day of school. This assignment will be graded for both completeness and correctness.

Questions? Contact: Miss Heerwagen at mheerwagen@rumsonfairhaven.org

Detach the portion below and give to Miss Heerwagen when you pick up your textbook.

I, _____________________________________________ (Print Your Name), have received the AP Statistics summer assignment and agree to complete it by the first day of class in September of 2019. I also see the list of supplies needed and will come to class prepared on the first day of school and every day forward.

_________________________________________________________ (Signature Here)

Textbook – The Practice of Statistics # __________
Part II: Please show all work below each question for full credit. Calculators are permitted.

Check Your Understanding: Page 5

1.

2.

Check Your Understanding: Page 18

1.

2.

3.

Check Your Understanding: Page 29

1.

2.
Part III: Multiple Choice: Please show all work below each question for full credit. Calculators are permitted.

1. You measure the age, marital status and earned income of an SRS of 1463 women. The number and type of variables you have measured is
   A. 14563.
   B. four; two categorical and two quantitative.
   C. four; one categorical and three quantitative.
   D. three; two categorical and one quantitative.
   E. three; one categorical and two quantitative.

2. A statistics teacher asks the 29 students in his statistics class how many minutes they spent on one homework assignment. The distribution of the variable “time on homework” is
   A. the difference between the longest time and the shortest time among the students’ responses
   B. a description of what values the variable takes and how often it takes them.
   C. the average distance between each value of the variable.
   D. the average time the students spent on the assignment.
   E. the number of students who were asked the questions—that is, 29.

3. Deciduous forests in the Eastern United States often have many different species of oak trees. Below is a frequency distribution for five different species of oaks found in sample plots a certain forest.

<table>
<thead>
<tr>
<th>Species of oak</th>
<th>Black</th>
<th>Red</th>
<th>Scarlet</th>
<th>Pin</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>25</td>
<td>14</td>
<td>12</td>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

Which of the following pie charts describes the same distribution?

A. [Pie chart A]
B. [Pie chart B]
C. [Pie chart C]
D. [Pie chart D]
E. [Pie chart E]
4. \( X \) and \( Y \) are two categorical variables. The best way to determine if there is a relation between them is to
   A. construct parallel box plots of the \( X \) and \( Y \) values.
   B. draw dot plots of the \( X \) and \( Y \) values.
   C. make a two-way table of the \( X \) and \( Y \) values.
   D. compare medians and interquartile ranges of the \( X \) and \( Y \) values.
   E. compare means and standard deviations of the \( X \) and \( Y \) values.

5. In a study of the link between high blood pressure and cardiovascular disease, a group of white males aged 35 to 64 was followed for 5 years. At the beginning of the study, each man had his blood pressure measured and it was classified as either "low" systolic blood pressure (less than 140 mm Hg) or "high" blood pressure (140 mm Hg or higher). The following table gives the number of men in each blood pressure category and the number of deaths from cardiovascular disease during the 5-year period.

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>Deaths</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10</td>
<td>2000</td>
</tr>
<tr>
<td>High</td>
<td>50</td>
<td>3500</td>
</tr>
</tbody>
</table>

Based on these data, which of the following statements is correct?

A. These data are consistent with the idea that there is a link between high blood pressure and death from cardiovascular disease.
B. The mortality rate (proportion of deaths) for men with high blood pressure is 5 times that of men with low blood pressure.
C. These data probably understimate the link between high blood pressure and death from cardiovascular disease, because men will tend to understate their true blood pressure.
D. Although there were more deaths in the high blood pressure group, this is expected, because there were 1500 more men in that group.
E. All of the above.

**Scenario 1-1**

A review of voter registration records in a small town yielded the following table of the number of males and females registered as Democrat, Republican, or some other affiliation.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democrat</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>Republican</td>
<td>500</td>
<td>300</td>
</tr>
<tr>
<td>Other</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

6. Use Scenario 1-1. The proportion of males that are registered as Democrats is
A. 300
B. 30
C. 0.33
D. 0.30
E. 0.15
7. Use Scenario 1-1 Your percentage from question number 12 is part of
   A. The marginal distribution of political party registration.
   B. The marginal distribution of gender.
   C. The conditional distribution of gender among Democrats.
   D. The conditional distribution of political party registration among males.
   E. The conditional distribution of males within gender.

8. Use Scenario 1-1. The proportion of registered Democrats that are male is
   A. 300
   B. 33
   C. 0.33
   D. 0.30
   E. 0.15

9. Use Scenario 1-1. Which of the following graphs accurately represents the distribution for political party registration for each gender?
   A. [Graph A]
   B. [Graph B]
   C. [Graph C]
   D. [Graph D]
   E. [Graph E]
10. The bar graph below summarizes responses of dog owners to the question, “Where in the car do you let your dog ride?”

![Bar graph showing percentages of dog riders in different parts of the car.]

Where does the dog ride?

Which of the following statements is false?
A. Some owners let their pets ride in more than one place in the car.
B. A majority of owners allow their pets to ride in the front passenger seat.
C. The most common place dogs ride is in the back seat.
D. The vertical scale of this graph exaggerates the difference between the percentage who let their dogs ride in the driver’s lap versus a passenger’s lap.
E. These data could also be presented in a pie chart.

11. The following histogram represents the distribution of acceptance rates (percent accepted) among 25 business schools in 1997.

![Histogram showing frequency distribution of percent accepted.]

What percent of the schools have an acceptance rate of under 20%?
A. 3%
B. 4%
C. 12%
D. 16%
E. 24%
12. The histogram below shows the distribution of heights for 100 randomly selected school children in Great Britain.

[Histogram image]

Which of the following descriptions best fits this distribution?
A. Roughly uniform, centered at about 150, range 110 to 190.
B. Roughly uniform, centered at about 150, range 80
C. Roughly symmetric, centered at about 150, range 110 to 190.
D. Roughly symmetric, centered at about 150, range 80.
E. Roughly symmetric, centered at about 150, range about 135 to 165.

13. Which of the following statements is NOT true?
A. In a symmetric distribution, the mean and the median are equal.
B. Fifty percent of the scores in a distribution are between the first and third quartiles.
C. In a symmetric distribution, the median is halfway between the first and third quartiles.
D. The median is always greater than the mean.
E. The range is the difference between the largest and the smallest observation in the data set.

14. A consumer group surveyed the prices for a certain item in five different stores, and reported the average price as $15. We visited four of the five stores, and found the prices to be $10, $15, $15, and $25. Assuming that the consumer group is correct, what is the price of the item at the store that we did not visit?
A. $5
B. $10
C. $15
D. $20
E. $25
15. The ages of people in a college class are as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>120</td>
<td>200</td>
<td>200</td>
<td>90</td>
<td>30</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

What is true about the median age?
A. It must be 20.
B. It must be 20.5.
C. It could be any number between 19 and 21.
D. It must be 21.
E. It must be over 21.

16. The median age of five elephants at a certain zoo is 30 years. One of the elephants, whose age is 50 years, is transferred to a different zoo. The median age of the remaining four elephants is
A. 40 years.
B. 30 years.
C. 25 years.
D. less than 30 years.
E. Cannot be determined from the information given.

17. A set of data has a mean that is much larger than the median. Which of the following statements is most consistent with this information?
A. The distribution is symmetric.
B. The distribution is skewed left.
C. The distribution is skewed right.
D. The distribution is bimodal.
E. The data set probably has a few low outliers.

18. Use Scenario 1-4. The interquartile range for the number of A.P. Courses is
A. 3 to 4
B. 2.5 to 5
C. 3 to 5
D. 2
E. 2.5
19. Use Scenario 1-4. Which of the following is a correct box plot for these data?

A. A
B. B
C. C
D. D
E. E

20. The mean age of four people in a room is 30 years. A new person whose age is 55 years enters the room. The mean age of the five people now in the room is

A. 30.
B. 35.
C. 37.5.
D. 40.
E. Cannot be determined from the information given.

Scenario 1-5
A sample was taken of the salaries of 20 employees of a large company. The following boxplot shows the salaries (in thousands of dollars) for this year.

21. Use Scenario 1-5. Based on the boxplot, which of the following statements is true?
A. The maximum salary is between $60,000 and $70,000.
B. The minimum salary is $20,000.
C. The range of the middle half of the salaries is about $20,000.
D. The median salary is about $40,000.
E. 25% of the employees make more than $70,000.
22. Use Scenario 1-5. Based on the boxplot, the five-number summary is
   A. 28, 39, 48, 60.5, 77.
   B. 28, 41, 48, 58, 77.
   C. 28, 39, 51, 58, 77.
   D. 28, 41, 51, 60.5, 77.
   E. 26, 39, 48, 60.5, 81.

23. There are three children in a room, ages three, four, and five. If a four-year-old child enters the room the
   A. mean age will stay the same but the variance will increase.
   B. mean age will stay the same but the variance will decrease.
   C. mean age and variance will stay the same.
   D. mean age and variance will increase.
   E. mean age and variance will decrease.

24. The standard deviation of 16 peoples’ weights (in pounds) is computed to be 5.4. The variance of these measurements is
   A. 2.24.
   B. 29.16.
   C. 52.34.
   D. 256.
   E. 21.6.

25. The standard deviation of 16 peoples’ weights (in pounds) is computed to be 5.4. The units for the variance of these measurements is
   A. pounds.
   B. square root pounds.
   C. pounds squared.
   D. no units. Variance never has units.
   E. percentiles.

26. A policeman records the speeds of cars on a certain section of roadway with a radar gun. The histogram below shows the distribution of speeds for 251 cars.

Which of the following measures of center and spread would be the best ones to use when summarizing these data?
   A. Mean and interquartile range.
   B. Mean and standard deviation.
   C. Median and range.
   D. Median and standard deviation.
   E. Median and interquartile range.
27. You want to use numerical summaries to describe a distribution that is strongly skewed to the left. Which combination of measure of center and spread would be the best ones to use?
   A. Mean and interquartile range.
   B. Mean and standard deviation.
   C. Median and range.
   D. Median and standard deviation.
   E. Median and interquartile range.

28. A lobster fisherman is keeping track of the productivity of a set of traps he has placed in a favorite location. Below are the numbers of lobsters in these traps over the course of 12 different hauls.

   0  3  3  3  4  5  5  6  7  7  12  14

   According to the 1.5 x IQR rule, which values in the above distribution are outliers?
   A. 0 only
   B. 14 only
   C. 12 and 14
   D. 0 and 14
   E. 0, 12, and 14

29. The stemplot below shows the number of home runs hit in 2008 by members of the Philadelphia Phillies, who won major League Baseball’s World Series that year. (Each of the 13 players who appeared in at least half the Phillies’ games that year is included). Note that 4 | 8 represents 48 home runs.

   0  0  2  4
   0  9  9  9
   1  1  4  4
   1
   2  4
   2
   3  3  3
   3
   4
   4  8

   The five number summary for these data is:
   A. 0, 9, 1, 3, 8
   B. 0, 9, 11, 33, 48
   C. 0, 6.5, 11, 28.5, 48
   D. 0, 6.5, 11, 28.5, 33
   E. 0, 4, 11, 24, 48
Chapter 1 Multiple Choice Answer Key Sheet:

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______

11. ______
12. ______
13. ______
14. ______
15. ______
16. ______
17. ______
18. ______
19. ______
20. ______

21. ______
22. ______
23. ______
24. ______
25. ______
26. ______
27. ______
28. ______
29. ______