

Homework #2

Name \_\_\_\_\_

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

Fill in the blank.

- 1) A variable is called \_\_\_\_\_ if observations on it take numerical values that represent different magnitudes of the variable. 1) \_\_\_\_\_
- 2) A variable is called \_\_\_\_\_ if each observation belongs to one of a set of categories. 2) \_\_\_\_\_
- 3) The \_\_\_\_\_ is the difference between the largest and the smallest data values. 3) \_\_\_\_\_
- 4) The five-number summary of a dataset consists of the \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. 4) \_\_\_\_\_

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

Classify as categorical or qualitative data.

- 5) A survey of automobiles parked in the student and staff lots at a large college recorded the make and model of the automobiles. The variable "make" is: 5) \_\_\_\_\_  
A) Categorical B) Quantitative
- 6) Your statistics teacher has gathered information on each of the students in your class in order to illustrate the difference between categorical and quantitative variables. For each student, she has recorded their major, gender, age and height. The variable "age" is an example of what type of variable? 6) \_\_\_\_\_  
A) Categorical B) Quantitative

Select the most appropriate answer.

- 7) The characteristics observed to address the questions posed in a study are called 7) \_\_\_\_\_  
A) parameters.  
B) variables.  
C) quantities.  
D) categories.  
E) statistics.

Classify the variable as either discrete or continuous.

- 8) The number of calls received between 8 a.m. and 5 p.m. by a technical support professional. 8) \_\_\_\_\_  
A) Discrete B) Continuous
- 9) The time it takes an athlete to run 100 meters. 9) \_\_\_\_\_  
A) Continuous B) Discrete

Select the most appropriate answer.

10) Which of the following is a continuous variable?

10) \_\_\_\_\_

- A) brand of tennis shoe
- B) number of pars in a round of golf
- C) number of homeruns in a professional baseball player's career
- D) type of fish caught
- E) daily high temperature in New York City

The heights (in inches) of 30 adult males are listed below. A frequency distribution show the frequency and relative frequency using five classes.

70 72 71 70 69 73 69 68 70 71  
67 71 70 74 69 68 71 71 71 72  
69 71 68 67 73 74 70 71 69 68

<u>Height (in inches)</u>	<u>Frequency</u>	<u>Relative Frequency</u>
67.0-68.4	6	0.20
68.5-69.9	5	0.167
70.0-71.4	13	0.433
71.5-72.9	2	0.067
73.0-74.4	4	0.133

11) Identify the variable.

11) \_\_\_\_\_

- A) Number of classes
- B) Frequency
- C) Height
- D) Number of adult males
- E) Relative frequency

12) A height of 69 inches belongs to the class having what frequency?

12) \_\_\_\_\_

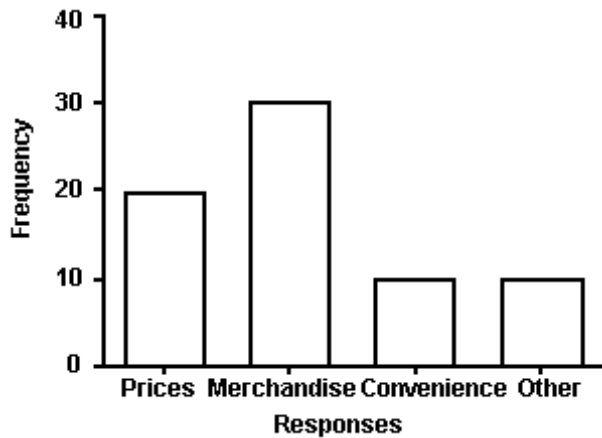
- A) 11                      B) 0.167                      C) 0.20                      D) 6                      E) 5

13) What percentage of the 30 adult males had heights between 73 and 74.4 inches?

13) \_\_\_\_\_

- A) 0.04
- B) none of these
- C) 0.133
- D) 4
- E) 13.3

A sporting goods retailer conducted a customer survey to determine its customers primary reason for shopping at their store. The results are shown in the graph below.

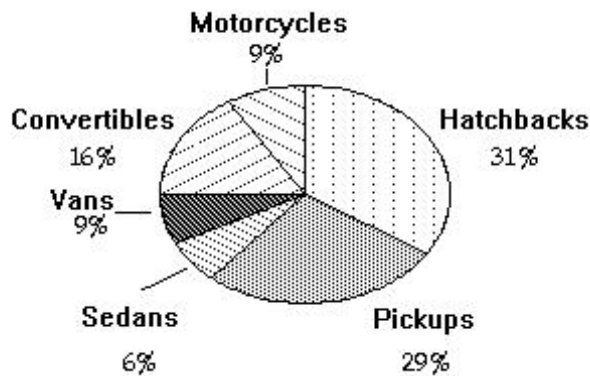


- 14) What proportion of the customers responded that the merchandise was the reason they shopped at the store? 14) \_\_\_\_\_
- A) 30
  - B) 0.30
  - C) 0.50
  - D) none of these
  - E) 0.43

- 15) What percentage of the customers gave "prices" or "convenience" as their answer? 15) \_\_\_\_\_
- A) 71%
  - B) 43%
  - C) 14%
  - D) 30%
  - E) 10%

Provide an appropriate response.

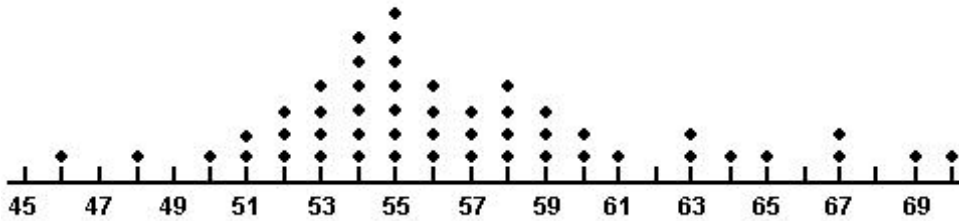
- 16) Results from a survey of 7116 vehicle types on the campus of State College are summarized in the following pie chart. 16) \_\_\_\_\_



How many of the vehicles were sedans? Give your answer to the nearest whole number.

- A) 427
- B) 6
- C) 600
- D) 4270
- E) 60

A sample of fifty motorists was taken on a Federal highway where the speed limit was 60 miles per hour. A dot plot of their speeds is shown below.



- 17) What proportion of the motorists were speeding? 17) \_\_\_\_\_  
 A) 0.72                      B) 2                      C) 0.18                      D) 0.04                      E) 0.22
- 18) What is the mode for speed? 18) \_\_\_\_\_  
 A) 60  
 B) 7  
 C) 70  
 D) 55  
 E) none of these
- 19) What is the variable of interest? 19) \_\_\_\_\_  
 A) number of motorists on the Federal highway  
 B) number of speeding motorists  
 C) whether or not a motorist was speeding  
 D) motorist's speed

A survey was conducted to determine how people rated the quality of programming available on television. Respondents were asked to rate the overall quality from 0 (no quality at all) to 100 (extremely good quality). The stem-and-leaf display of the data is shown below.

Stem	Leaves
3	2 6
4	0 3 4 7 8 9 9 9
5	0 1 1 2 3 4 5
6	1 2 5 6 6
7	1 7
8	
9	3

- 20) What percentage of the respondents rated overall television quality as very good (regarded as ratings of 80 and above)? 20) \_\_\_\_\_  
 A) 3%                      B) 12%                      C) 1%                      D) 32%                      E) 4%
- 21) What is the mode rating? 21) \_\_\_\_\_  
 A) 93                      B) 51                      C) 9                      D) 49

Find the original data from the stem-and-leaf plot.

	Stem	Leaves
22)	8	5 8
	9	1 8
	10	5 5

- A) 85, 81, 88, 91, 101, 105
- B) 85, 88, 91, 91, 105, 105
- C) 81, 85, 81, 98, 108, 105
- D) 81, 88, 81, 98, 105, 105
- E) 85, 88, 91, 98, 105, 105

22) \_\_\_\_\_

Answer true or false.

23) If a distribution is very highly skewed, the mean is usually preferred over the median because it better represents what is typical.

A) False

B) True

23) \_\_\_\_\_

Provide an appropriate response.

24) Brandon kept track of the number of hours he spent exercising each week for four months. The results are shown below. Find the mean number of hours Brandon spent exercising per week. Round your answer to two decimal places.

7.50 8.20 7.10 7.90 8.00 7.50  
7.80 7.10 7.30 7.50 7.90 8.90  
7.10 8.20 8.20 8.20 8.00 7.80

A) 8.25

B) 7.79

C) 7.38

D) 8.01

E) 7.30

24) \_\_\_\_\_

Find the median for the given sample data.

25) A store manager kept track of the number of newspapers sold each week over a seven-week period. The results are shown below.

95, 38, 221, 122, 258, 237, 233

Find the median number of newspapers sold.

A) 221 newspapers

B) 122 newspapers

C) 233 newspapers

D) 258 newspapers

E) 172 newspapers

25) \_\_\_\_\_

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

Provide an appropriate response.

- 26) In order to reduce pollutants from motor vehicle exhaust emissions, three-way catalytic converters have been installed in new vehicles. However, these converters increase the level of ammonia in the air. A study was published on the ammonia levels near the exit ramp of a San Francisco highway tunnel. The data below represent daily ammonia concentrations (parts per million) on eight randomly selected days during afternoon drive-time in the summer of 1999. 26) \_\_\_\_\_

1.53	1.50	1.37	1.51	1.55	1.42	1.41	1.48
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Source: Environmental Science & Technology (Sept. 1, 2000)

Find the median.

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

- 27) The heights (in inches) of 20 adult males are listed below. Find the range of the data. 27) \_\_\_\_\_

70 72 71 70 69 73 69 68 70 71  
67 71 70 74 69 68 71 71 71 72

- A) 5                      B) 5.5                      C) 6                      D) 7                      E) 6.5

- 28) The cost for one semester's books (in dollars) are given below for a sample of five college students. Calculate the sample standard deviation,  $s$  of the book costs. 28) \_\_\_\_\_

340, 170, 145, 420, 120

- A) 118.93                      B) 132.97                      C) 17,680                      D) 300

- 29) According to The College Board, the mean score on the SAT writing section was 497 for the 2006 graduating class. Noting that this test is scored on a scale of 200 to 800, what is the most plausible value for the standard deviation of the scores? 29) \_\_\_\_\_

- A) 110                      B) 10                      C) 200                      D) 300                      E) -10

- 30) The heights (in inches) of 10 adult males are listed below. Find the standard deviation,  $s$ . 30) \_\_\_\_\_

70 72 71 70 69 73 69 68 70 71

- A) 20.10                      B) 1.42                      C) 1.49                      D) 2.23                      E) 2.01

Select the most appropriate answer.

- 31) Which of the following numerical summary measures cannot be negative? 31) \_\_\_\_\_

- A) Q3  
B) standard deviation  
C) mean  
D) mode  
E) z-score

Provide an appropriate response.

- 32) A competency test has scores with a mean of 69 and a standard deviation of 4. A histogram of the data shows that the distribution is normal. Use the Empirical Rule to find the percentage of scores between 61 and 77. 32) \_\_\_\_\_
- A) 99.7%                      B) 50%                      C) 77%                      D) 95%                      E) 68%

- 33) Use the following summary information for a data set of 100 observations to determine whether the data set is likely to be bell-shaped, skewed to the right or skewed to the left. 33) \_\_\_\_\_
- Mean = 120,  $s=22$ , Minimum=103, Maximum=170
- A) skewed to the right  
B) unable to determine from the information given  
C) skewed to the left  
D) bell-shaped

Determine the quartile, percentile or interquartile range as specified.

- 34) The test scores of 19 students are listed below. Find the interquartile range. 34) \_\_\_\_\_
- 91 46 86 70 61  
63 97 56 90 77  
82 83 52 88 74  
43 92 94 67
- A) 25.5                      B) 28.5                      C) 27                      D) 29.5                      E) 29

- 35) When Scholastic Achievement Scores (SAT's) are sent to test-takers, the percentiles associated with their scores are also given. Suppose a test-taker scored at the 75th percentile for their verbal grade and at the 37th percentile for their quantitative grade. Interpret these results. 35) \_\_\_\_\_
- A) This student performed better than 75% of the other test-takers in the verbal part and better than 63% in the quantitative part.  
B) This student performed better than 25% of the other test-takers in the verbal part and better than 37% in the quantitative part.  
C) This student performed better than 25% of the other test-takers in the verbal part and better than 63% in the quantitative part.  
D) This student performed better than 75% of the other test-takers in the quantitative part and better than 37% in the verbal part.  
E) This student performed better than 75% of the other test-takers in the verbal part and better than 37% in the quantitative part.

Select the most appropriate answer.

- 36) One-fourth of the dataset lies 36) \_\_\_\_\_
- A) below Q3.  
B) above Q2.  
C) above Q1.  
D) between Q1 and Q3.  
E) above Q3.

- 37) Which of the following numerical summary measures is not sensitive to outliers in a dataset? 37) \_\_\_\_\_
- A) standard deviation  
B) none of these  
C) range  
D) interquartile range  
E) mean

Identify potential outliers, if any, for the given data.

38) The test scores of 15 students are listed below.

38) \_\_\_\_\_

36 40 48 65 67  
69 70 73 75 76  
79 82 87 90 99

- A) 36, 99      B) None      C) 90, 99      D) 36      E) 36, 40

Find the five-number summary for the given data.

39) The salaries (in millions of dollars) of the top 10 highest paid CEOs in the U.S. in 2006 according to Forbes business magazine.

39) \_\_\_\_\_

249.42 230.55 139.96 135.53 122.67 80.73 75.33 71.84 69.66 68.95

- A) 68.95, 71.84, 101.7, 139.96, 230.55  
B) 68.95, 71.84, 122.67, 139.96, 230.55  
C) 68.95, 71.84, 101.7, 139.96, 249.42  
D) 0, 71.84, 122.67, 139.96, 230.55  
E) -0.48, 71.84, 101.7, 139.96, 203.88

Construct a boxplot as specified.

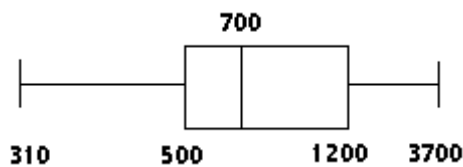
40) The weekly salaries (in dollars) of 24 randomly selected employees of a company are shown below.

40) \_\_\_\_\_

Construct a boxplot for the data set. What is the shape of the distribution?

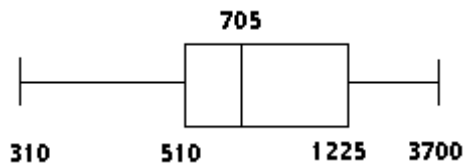
310 320 450 460 470 500 520 540  
580 600 650 700 710 840 870 900  
1000 1200 1250 1300 1400 1720 2500 3700

A)



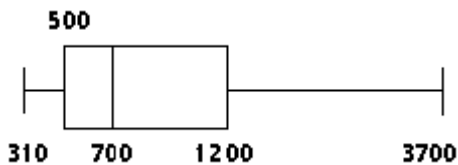
Bell-shaped

B)



Skewed-left

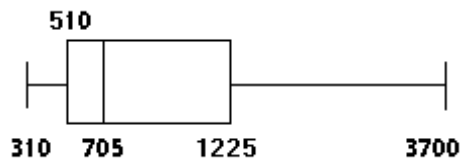
C)



Skewed-right

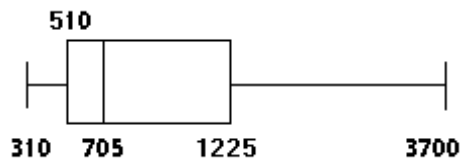


D)



Skewed-right

E)



Skewed-left