

Time Limit: 90 minutes

Any calculator is okay, but no computers, cell phones or other hand-held devices are allowed. Tables and formulas are attached to the back of the exam. Not other formulas, tables or notes are allowed. All problems are weighted equally.

1) A study was conducted to determine if listening to heavy metal music affects critical thinking. To test the claim, 124 subjects were randomly assigned to two groups. Both groups were administered a basic math skills exam. The first group took the exam while heavy metal music was piped into the exam room, while the second group took the exam in a silent room. The mean exam score for the first group was 81, and the mean exam score for the second group was 87. The researchers concluded that heavy metal music negatively affects critical thinking. Identify the following:

(a) the research objective

(b) the experimental design (completely randomized, matched-pairs, or randomized block)

(c) the descriptive statistics

(d) the sample

2) Give an example of

(a) qualitative data

(b) quantitative data

3) Identify the level of measurement of each of the following as interval, ordinal, ratio, or nominal.

(a) the year of manufacture of a car

(b) time spent playing basketball

4) Construct a pie chart for the data. Label each category with its percentage.

A study was conducted to determine how people get jobs. Four hundred subjects were randomly selected and the results are listed below. Round percents to whole numbers.

Job Sources of Survey Respondents	Frequency
Newspaper want ads	72
Online services	124
Executive search firms	69
Mailings	32
Networking	103

5) The scores for an economics test are listed below. Create a sorted stem-and-leaf plot for the data.

87 76 92 77 93 98 88 85 66 89
79 97 54 99 83 88 82 58 15 69

6) Construct a frequency distribution chart for the data using five classes. Describe the shape of the distribution of weekly grocery bills (in dollars) for 20 randomly selected households.

135 120 115 132 136 124 119 145 98 110
125 120 115 130 140 105 116 121 125 108

(a) chart for frequency distribution

(b) shape of distribution

7) What is the difference between a bar chart and a histogram? (Circle correct response.)

- A) The bars in a bar chart may be of various widths while the bars of a histogram are all the same width.
- B) The bars in a bar chart are all the same width while the bars of a histogram may be of various widths.
- C) The bars on a bar chart do not touch while the bars of a histogram do touch.
- D) There is no difference between these two graphical displays.

Draw a frequency histogram for the previous problem, #6. Label the axes.



8) The accompanying data set contains quiz scores for 12 students in a chemistry class:

18, 15, 5, 8, 15, 20, 2, 16, 10, 12, 20, 15

a. What is the measure of central tendency that separates the data into two groups such that each group consists of 50% of the scores above and 50% of the scores below that measure?

Find this value _____

b. What is the measure of central tendency that represents the quiz score that occurs most often?

Find this value _____

c. What is the measure of central tendency that represents the average of the 12 quiz scores?

Find this value _____

9) In a random sample, 10 employees at a local plant were asked to compute the distance they travel to work to the nearest tenth of a mile. The data is listed below. Compute the range and sample standard deviation of the data.

1.1 5.2 3.6 5.0 4.8 1.8 2.2 5.2 1.5 0.8

range _____

sample standard deviation (rounded to two decimal places) _____

10) For the following data, approximate the mean weekly grocery bill. Round to nearest cent.

Bill (in dollars)	Frequency
135-139	17
140-144	14
145-149	6
150-154	8
155-159	11

mean weekly grocery bill _____

11) A highly selective boarding school will only admit students who place at least 1.5 z-scores above the mean on a standardized test that has a mean of 110 and a standard deviation of 12. What is the minimum score that an applicant must make on the test to be accepted?

- A) 92
- B) 122
- C) 128
- D) 98

12) To study the physical fitness of a sample of 28 people, the data below were collected representing the number of sit-ups that a person could do in one minute.

10	12	12	15	15	15	18
20	22	25	25	26	29	30
32	33	40	40	40	45	46
47	48	48	50	52	53	56

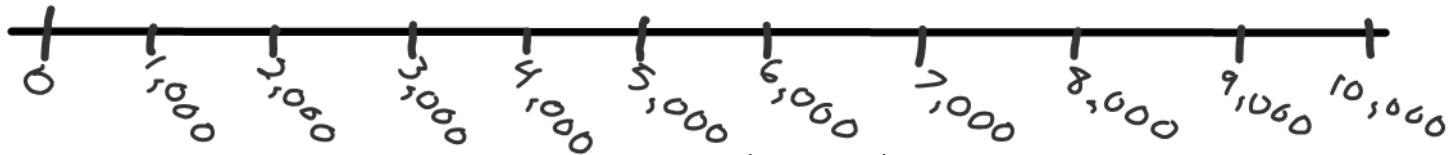
Determine the lower and upper fences.

lower fence _____

upper fence _____

Are there any outliers according to this criterion? _____

- 13) A survey of 200 public universities indicated that the 25th percentile of the yearly tuition cost of the universities was \$4100 and the 75th percentile was \$7900. The minimum value was \$2000, the median was \$6000, and the maximum was \$10,000. Use this information to construct a boxplot for the yearly tuition costs, assuming no outliers.



- 14) The data below are the number of hours worked (per week) and the final grades of 9 randomly selected students from a drama class. Calculate the linear correlation coefficient.

Hours worked, x	0	3	6	4	9	2	15	8	5
Final Grade, y	99	87	81	83	72	93	56	77	83

linear correlation coefficient (rounded to three decimal places) _____

What is the critical value? _____

Does a significant linear correlation exist? _____

Why or why not?

- 15) The data below are the final exam scores of 10 randomly selected history students and the number of hours they slept the night before the exam.

Hours, x	3	5	2	8	2	4	4	5	6	3
Scores, y	65	80	60	88	66	78	85	90	90	71

What is the equation of the regression line for the given data? (Round all numbers to four digits.)

What would be the predicted score for a history student who slept 15 hours the previous night? (Round to the nearest whole number.)

Is this a reasonable question? _____

Why or why not?