

MATH 109 Statistics Exam 1 Practice

INSTRUCTIONS:

Carefully read each problem statement and provide the solution for the question that is asked. Note that certain answers must be in the correct form to receive full credit.

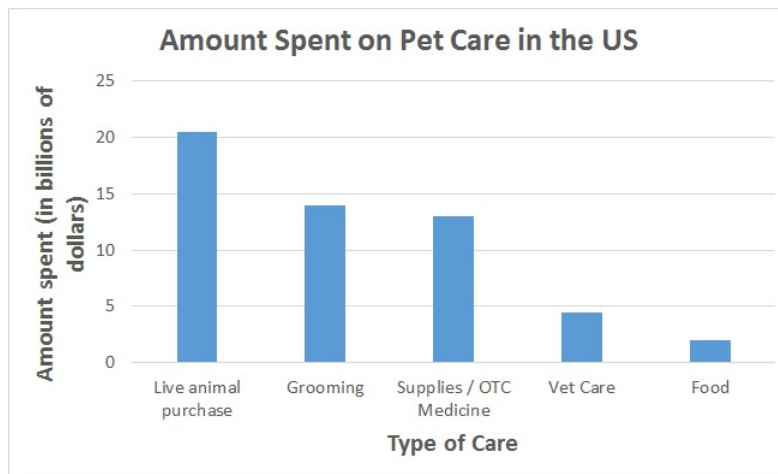
Show work and give supporting reasoning. Box/circle/clearly indicate ALL final answers. Your work needs to be neat enough, and your final answer needs to be clear enough, that I can easily decipher your solution. Sloppiness will negatively affect your grade on this exam.

You may use an approved calculator on this exam. Refer to the course syllabus for the official calculator policy.

A normal table will be provided for your reference.

Problem 1: (1.1.29) A survey of 55 US law firms found that the average hourly billing rate was \$425. Identify the population and the sample involved. Is \$425 a parameter or a statistic?

Problem 2: (2.2.16) A display is shown below. Use it to answer the questions that follow.



- (A) What is/are the variable(s) in the display? For each variable, specify whether it is qualitative or quantitative.
- (B) What type of display is it?

Problem 3: (2.1.33) The data set below shows reaction times (in milliseconds) of 30 adult females to an auditory stimulus. Use it to answer the questions that follow.

507	389	305	291	336	310	514	442
373	428	387	454	323	441	388	426
411	382	320	450	309	416	359	388
307	337	469	351	422	413		

- (A) Compute the range of the data.
- (B) Construct a frequency distribution with 8 classes.
- (C) Construct a frequency histogram with 8 classes.

- (D) Use the frequency distribution to estimate the mean. (DO NOT COMPUTE THE MEAN FROM THE DATA VALUES.)
- (E) Describe the shape of the frequency histogram (modes, skewness, outliers).

Problem 4: (5.1) Find the area under the standard normal curve.

- (A) To the left of $z = 0.08$
- (B) To the right of $z = 3.25$
- (C) Between $z = -0.5$ and $z = 1.5$

Problem 5: (1.3.11) In a survey of 177,237 US adults, 65% said they visited a dentist in the last 12 months. Does this describe a prospective observational study, retrospective observational study, or an experiment?

Problem 6: (2.3.32) The stem-and-leaf plot below displays the grade point average of students in a class. Use the plot to answer the questions that follow. (Key: 0 | 8 = 0.8 GPA)

0	8				
1	5	6	8		
2	1	3	4	5	
3	0	9			
4	0	0			

- (A) What is the class width?
- (B) What is the mean GPA?
- (C) What is the median GPA?
- (D) What is the standard deviation of GPA?
- (E) Describe the shape of the distribution (modes, skewness, outliers).

Problem 7: (2.5.56) Use the dataset below to answer the questions that follow.

22	25	22	24	20
21	20	23	25	23
24	19	22	29	21
23	21	25	23	22

- (A) Find the Five Number Summary.
- (B) Find the IQR.
- (C) Draw a boxplot.
- (D) Identify any outliers.

Problem 8: (1.2.12) For the trees in a certain forest, the heights and species of each tree is recorded. Identify the variables of this data, and specify whether each variable is qualitative or quantitative.

Problem 9: (1.1.12) The amount of energy collected from every wind turbine on a wind farm is recorded. Is this data concerning a population or a sample? Justify your answer.

Problem 10: (5.3) Find the z -score that corresponds to...

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- (A) the 85th percentile
 - (B) the area to the right of z is 0.7190
 - (C) the area to the left of z is 0.5987

Problem 11: (1.3.25) A researcher questions 358 students as they leave the university library about their drinking habits. What type of sampling was used: SRS, Stratified, Cluster, Convenience, or Systematic?