

Statistics 515 - Spring 2003 Exam 1 (Modified for Fall 2003 Practice)

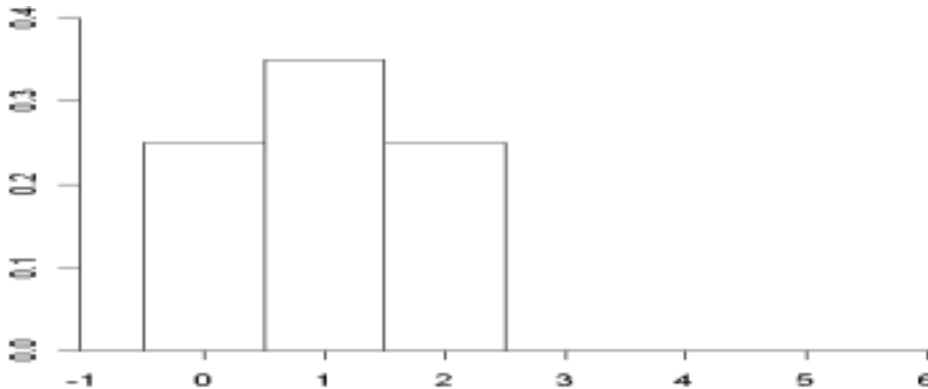
Answer seven of the following eight questions. If you complete more than seven, I will grade only the first seven. Five points each.

1) (Circle the correct answers) Ten 2003 Ford Explorers are selected at random from the production line throughout the year and crashed into a concrete pylon at 15 miles per hour. The amount of damage to the bumpers of these ten SUVs averaged \$2,425.

The set of all 2003 Ford explorers is the sample / population.
The ten selected 2003 Ford explorers is the sample / population.
The amount of damage is a quantitative / qualitative variable.

2) A sample of discrete data consists of the values 0, 1, 2, 3, 4, and 5. Complete the unfinished histogram for this data based on the given relative frequency table. (Yes, they really do want the third interval to be wider!)

Class Interval	Frequency	Relative Frequency
$[-0.5, 0.5)$	25	0.25
$[0.5, 1.5)$	35	0.35
$[1.5, 2.5)$	25	0.25
$[2.5, 5.5)$	15	0.15



3) (Circle the correct answers) The alumni at a large non-research university consist of several thousand people who earn between \$0 and \$45,000 per year, several hundred who earned between \$45,000 and \$70,000 per year, and one who earned \$8.4 million. These alumni salaries are skewed left / symmetric / skewed right. The school would look like its alumni were more successful if it reported the mean / median annual income.

4) A data set is highly skewed. It has a mean of 100 and a standard deviation of 15. What can we say about the percentage of the data that is between 70 and 130?

5) $P(A)=0.12$, $P(B)=0.16$. What can we say about $P(A|B)$ if A and B are independent? _____
What can we say about $P(A|B)$ if A and B are mutually exclusive? _____

6) $P(A)=0.12$, $P(B)=0.16$, and $P(A \cap B) = 0.08$. Find $P(A|B)$

7) Let the random variable X have the following distribution:

x	1	4	7
p(x)	0.25	0.5	0.25

What are the mean and standard deviation of X?

8) How many different ways are there to divide a group of fifteen people into one group of size 4 and another of size 11? (Simplify your answer.)

Part II: Answer every part of the next two problems. Read each problem carefully, and show your work for full credit. Twenty points each.

1) For the data set: 5 oz. 4 oz. 2 oz. 2 oz. 7 oz.
answer the following questions, being **sure to use the appropriate units**. You must show all of your work for credit.

a) Find the mean.

b) Find the median.

c) Find the range.

d) Find the variance.

e) Find the standard deviation

2) A candidate in a primary election hopes to have support from at least 35% of the likely voters in a state. A random survey of 200 likely voters is made the day before the election, and they are asked whether they S=support or N=do not support the candidate. The number of people who support the candidate is summed up.

a) One of the assumptions of using the binomial distribution is that the probability of observing a success does not change from trial to trial. But in this example if you take a supporter out of the state then there is a smaller percentage of supporters left to choose the next person from! Why does it still seem reasonable to use the binomial distribution though?

b) If 35% of the likely voters in the entire state favor the candidate, what is the probability that exactly 80 of the 200 surveyed will favor the candidate? (You do not need to simplify your answer.)

c) If 35% of the likely voters in the entire state actually do favor the candidate, how many of the 200 surveyed are expected to favor her on average?

d) If 35% of the likely voters in the entire state actually do favor the candidate, what is the standard deviation of the number out of 200 surveyed who will favor her?