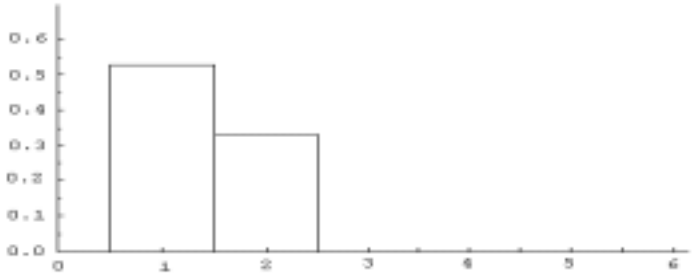
Statistics 515 - Fall 2001 - Exam 1 *(slightly modified for Fall 2002 Practice)*

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

1) A sample of data ranges from around a half to around five and a half. Complete the unfinished histogram for this data.

Class Interval	Frequency	Relative Frequency
[0.5, 1.5)	53	0.53
[1.5, 2.5)	32	0.32
[2.5, 5.5)	15	0.15



2 (Circle the correct answers) A town consists of several less expensive subdivisions of houses, and one very expensive subdivision. To make the cost of living sound as inexpensive as possible the town should report the **mean / median** housing price. The distribution of housing prices is **symmetric / skewed to the left / skewed to the right**.

3) A data set is highly skewed. It has a mean of 50 and a standard deviation of 5. What can we say about the percentage of the data that is between 40 and 60?

4) P(A)=0.5, P(B)=0.2. If A and B are mutually exclusive, what is P(AUB)?

5) P(A)=0.5, P(B)=0.2. If A and B are independent, what is P(AUB)?

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

x	1	2	4
p(x)	0.2	0.2	0.6

What are the mean and variance of X?

7) X is a normal random variable with $\mu=100$, $\sigma^2=225$, and $\sigma=15$. Find $P(X \geq 145)$.

8) Z is a standard normal random variable. Find z_0 such that $P(Z \leq z_0) = 0.0179$.

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: 1 ounce 6 ounces 3 ounces 2 ounces 3 ounces
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 variance.

d) Find the range.

e) Find the relative frequency of 6 ounces.

2) An experiment consists of rolling a fair, six-sided die 120 times. The experimenter keeps track of the total number of times a six was rolled (so, X=# of sixes rolled out of 120 trials).

a) What is the expected number of sixes rolled out of 120 times?

b) What is the standard deviation of the number of sixes rolled out of 120 times?

c) What is the exact probability that exactly 20 sixes would be rolled out of 120 times? (You do not need to simplify your answer).

d) What is the exact probability that 20 or fewer sixes would be rolled out of 120 times? (You do not need to simplify your answer).

e) Assume the number of sixes rolled is approximately normal with the mean and standard deviation you found above. Use the normal table to find $P(X \leq 20.5)$.