

Math 160 K

THIRD HOUR EXAM

NAME _____

General Notes:

1. Show work.
2. Look over the test first, and then begin.
3. Calculators are permitted on this exam, but only for basic arithmetic (i.e., no statistical calculations)

Friday, November. 13, 2009
100 pts.

I. Some definitions (5 pts. each) Give brief definitions (or short answers as requested) of the following. Please note that what is being asked for here is the definition of the term as it is used in statistics, and particularly as it is used in our textbook.

a. Parameter

b. Statistic

c. Sampling Distribution

d. Variability of a statistic. How do we reduce it?

(Problem I continued - definitions)

e. What is the IRB and what is its role?

f. Random phenomenon

g. Probability of a random phenomenon

h. Random variable

i. What is the difference between a discrete and a continuous random variable

II. Probability

Suppose that a random phenomenon has four possible distinct outcomes, with probabilities as follows:

Outcome	O_1	O_2	O_3	O_4
Probability	0.25	0.31	0.2	

1. (5 pts.) Fill in the missing probability.
2. (5 pts.) What is the probability that either outcome 1 or outcome 3 occurs?
3. (10 pts) What are the rules for a probability distribution (such as in this table above)?

4. (5 pts.) A die has been "adjusted" so that instead of the numbers 1, 2, 3, 4, 5, 6 appearing with equal probability, 5 occurs three times as often as a 1. The numbers 1, 2, 3, 4, and 6 all occur with equal probabilities. What is the probability distribution? That is, calculate the probabilities that a 1 appears, or that a 2 appears, etc.

5. Associated with the outcomes above is a discrete random variable X with values and probabilities as follows: In the following two questions, please show your work (remembering that you may use your calculator for the basic arithmetic operations (+, -, *, /) but that you may not use the statistical functions of your calculator.).

X	4	3	1	2
Probability	0.25	0.31	0.2	

- a. (5 pts.) Calculate the mean of X, μ_X
- b. (10 pts.) Calculate the variance of the random variable, σ_X^2
6. (15 pts.)
- A part number consists of three digits each 0 - 9
- a. How many part numbers are possible?

(continuation of problem 6 on the preceding page)

b. Assuming that all part numbers are equally likely, what is the probability

i. Of the part number "123"

ii. That a part number has no occurrence of the digit '5'.

iii. That a part number has at least one '5'