

MA 118 -- Review/Summary for Exam 2

Bring a calculator. You will need one on part of the exam.
Bring your textbook. You will be able to use it on part of the exam.
(If you want to mark pages, like with post-it-notes, that is fine.)
binomial, z & t charts will be attached

Part 1: Open Book portion About 60 of 80 points

This part of the exam consists of 13 questions/problems, including questions taken from the following categories:

1. Confidence intervals involving μ and p
2. Probabilities involving normal distributions (from raw score to prob, and from prob back to raw score)
3. Probabilities involving the central limit theorem (i.e. involving \bar{X})
4. Probabilities involving the binomial distribution
5. Be able to tell if a given function is a legitimate pdf.
6. Be able to find probabilities and expected values from a pdf.
7. Understand what the graph of a simple continuous pdf looks like, and how to use it to calculate probabilities.

Part 2: Closed Book portion About 20 of 80 points

You will be asked to answer from 5 to 8 of the vocab questions. Go to the class website for the full list.

At the start of the exam you will be able to choose your preferred sequence of the two parts of the exam.

Option 1: You may start with the open book, put it aside to do the closed book, then return to the open book when the closed book part is finished.

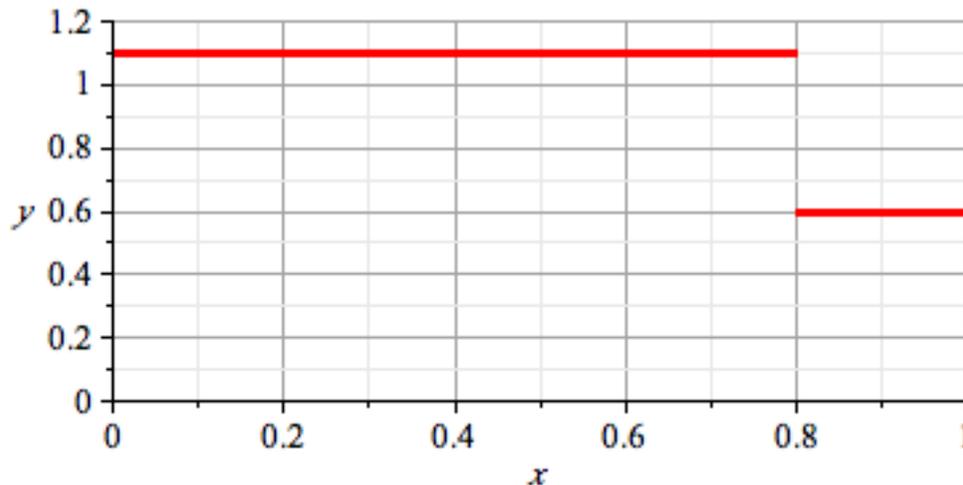
Option 2: You may start with the closed book, complete it, then move on to the open book.

This part of the exam consists of 6 problems (12 parts) and is worth 59 points. Show any relevant work in the space provided. Partial credit will be given on most problems, but only for proper information or work which is shown. You may ask for help or clarification on problems, though I may tell you I cannot give you any more information, or I might tell you that help will cost you points. You may use a calculator and your textbook on this part of the exam. Good luck!

Note: Some problems on this exam are labeled "Show something pre-calculator." That means you should be able to show (and I want to see) some form of your answer prior to you using your calculator. A final answer alone will not be sufficient.

Note: Some problems on this exam are labeled "Show all of your work." That means you should lay out all of the calculation pieces for me to see, though you may use your calculator for the actual calculation.

1. (4 points each) Every Friday night, sometime between 7:00 and 8:00, your mom calls you at college. The graph below shows the continuous pdf for the times of her calls. (0 represents 7:00, while 1 represents 8:00.)



- Find the probability she calls between 0.2 and 0.4.
- Find the probability she calls after 0.6.

2. In a certain dice game, a weighted six-sided die is rolled, and the number of dots showing is observed. Prizes are awarded based upon the number of dots showing, with the least likely sides earning the greatest prizes. The chart below shows the details:

# of dots	Prob	Prize
1	0.50	\$2.00
2	0.15	\$4.00
3	0.10	\$8.00
4	0.10	\$16.00
5	0.10	\$20.00
6	0.05	\$50.00

- (6 points) What is the expected value of this game? (That is, how much can a person EXPECT to win with each play of the game?) (Show something pre-calculator.)
- (2 points) Suppose it costs you \$6.00 each time you play this game. Financially speaking (and ignoring any opposition you might have to gambling), is this a good game to play? Briefly state why or why not.
- (4 points) Does the chart show a pdf? Explain how you know.
- (4 points) What is the mean number of dots you should get from this experiment? (That is, find the mean of the distribution.) Hint: This is another expected value.

3. (5 points each) The heights of male ENC students are normally distributed with a mean of 70 inches and a standard deviation of 5 inches. Show something pre-calculator on each part below.

- If we choose one ENC male at random, what is the probability that person's height is between 64 and 78 inches?
- What male ENC student height chops off the top 10% of heights? (Or put another way, what is the 90th percentile of heights?)
- If we take a random sample of 16 ENC males, what is the probability their mean height is more than 73?

4. (8 points) For experimental purposes only, I recently sampled the bag of Jolly Rancher candy in my office. On 35 draws from the bag I observed the following:

Flavor	Frequency
Grape	6
Blue Raspberry	6
Sour Apple	6
Cherry	10
Watermelon	7

Construct a 95% confidence interval for the true proportion of watermelon Jolly Ranchers in the bag.
(Show your work.)

5. (8 points) This example involves time on a clock. To keep things simple, I've converted everything to hours (no minutes), so 6.25 would be a quarter-hour after 6:00, or 6:15. I recommend you leave everything in this decimal form.

Sunday morning is the only morning during the week when my alarm clock does NOT go off before 5.50 a.m. Yet, on this morning when I am able to sleep in, it appears that I don't. In a random sample of 12 Sunday mornings, my average wake-up times were 5.85, with a standard deviation of 0.20 hours. Find a 95% CI for my true mean wake-up time.
(Show your work.)

6. (4 points) Suppose the random variable X has a binomial distribution with parameters $n = 8$ and $p = 0.40$. Find the following probability: $P(X \leq 2)$

Hint: You may use either the table or the formula on this one.