

Practice for Math 119 Final Exam

1. Two percent of hair dryers produced in a certain plant are defective. Use the normal approximation to the binomial distribution to estimate the probability that of 10,000 randomly selected hair dryers, exactly 225 are defective.
2. Scores on a test are normally distributed with a mean of 66.2 and a standard deviation of 9.0. Find the score that separates the top 80% from the bottom 20%.
3. The test scores of 50 students are summarized in the frequency table below. Find the sample mean and standard deviation for the scores.

score	students
50-59	3
60-69	21
70-79	19
80-89	5
90-99	2

4. If $x_1 = 26$, $n_1 = 66$, $x_2 = 39$, and $n_2 = 76$, construct a 95% confidence interval for the difference between the population proportions $p_1 - p_2$.
5. A manufacturer makes ball bearings that are supposed to have a mean weight of 30 g. A retailer suspects that the mean weight is actually less than 30 g. The mean weight of a random sample of 16 ball bearings is 29.5 g with a standard deviation of 4.3 g. At the .05 significance level, test the claim that the mean is less than 30 g. Assume the weights are normally distributed.
6. Find the sample mean and standard deviation for the following data:
33 40 38 64 53 62
7. On a multiple choice test with 5 questions, each question has four possible answers. For students who guess at all the answers, find the mean and standard deviation for the number of correct answers.
8. A study was made to determine which cab company gave quicker service. Companies A and B were each called 50 randomly selected times. The response times were as follows.

	A	B
sample size	50	50
sample mean	7.6 minutes	6.9 minutes
sample standard deviation	1.4 minutes	1.7 minutes

At the 2 percent level of significance, test the claim that the companies have the same mean response time.

9. Twenty randomly selected students took a calculus final. If the sample mean was 77.0 and the sample standard deviation was 5.6, construct a 99 percent confidence interval for the mean score of all the students. Assume the scores are normally distributed.

10. The table below shows the soft drink preferences of people in three age groups.

	cola	lemon-lime	diet cola
under 21	40	25	20
between 21 and 40	35	20	30
over 40	20	30	35

If one of the subjects is randomly selected, find the probability that the person prefers cola given that the subject is over 40.

11. Of 92 randomly selected adults from a certain town, 68 have health insurance. Construct a 90% confidence interval for the true proportion of all adults in the town who have health insurance.

12. If a computer randomly generates 5 digits, what is the probability it will produce a sequence of 5 nines?

13. A company manufactures calculators in batches of 64 and there is a 4% rate of defects. Find the probability of getting exactly 3 defects in a batch.

14. A department store accepts only its own credit card. Among 36 randomly selected cardholders, it was found that the mean amount owed was \$175.37, while the population standard deviation was \$84.77. Use a .05 level of significance to test the claim that the mean amount owed by all customers is greater than \$150.00.