

You are allowed to operate a calculator and refer to one page (front and back of standard 8.5 by 11 inch sheet) of notes while taking this examination. Your solutions should be clear, complete, and sufficiently detailed in order to demonstrate your understanding and communicate your reasoning and method of solving the problem. Each problem will be evaluated on a 5-point standard rubric.

\_\_\_\_\_  
Student's Name

### Problem 1

Twenty-five different automobiles were tested in dry conditions at a speed of 65 miles per hour for total stopping distance. The sample results, measured in feet, are given below.

345, 348, 342, 348, 342, 337, 342, 349, 346, 347, 358, 351, 343, 347, 349,  
350, 345, 340, 352, 349, 353, 346, 338, 345, 339

Estimate the mean total stopping distance for automobiles traveling at 65 mph in dry conditions using this sample and a 95% confidence interval. Assume that the total stopping distance for automobiles traveling at 65 mph in dry conditions is normally distributed. Express the estimate both symbolically and verbally.

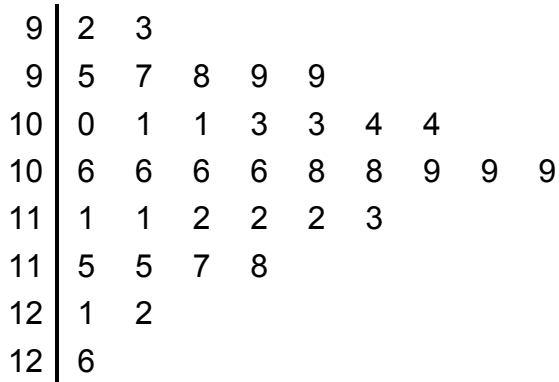
**Problem 2**

An article published in the American Journal of Hypertension reported the results of a longitudinal study on blood pressure. Ten years ago, 51 out of 188 people evaluated were classified as having high blood pressure. This year, 63 out of 194 people evaluated were classified as having high blood pressure.

Based on the results of this study, can one conclude that the proportion of people in the population with high blood pressure has increased in the last ten years? Use  $\alpha = 0.05$ .

**Problem 3**

Thirty-six Loggerhead Sea Turtle (*Caretta caretta*) nests were uncovered, and the number of eggs in each nest (the clutch size) was counted. A stem-and-leaf plot for this sample is given below.



The South Carolina Department of Natural Resources website states that the average clutch size for the Loggerhead Sea Turtle population in South Carolina is 120 eggs per nest. Conduct a hypothesis testing procedure to determine if the mean clutch size for the population of Loggerhead Sea Turtles from which the above sample was selected is 120 eggs per nest.

**Problem 4**

The principal at Tahoe Elementary School randomly selected three of the school's twelve classes of students to participate in an opinion poll. All of the children in each of the three randomly selected classes were asked the question "What is your favorite fruit to eat?". The following results were obtained.

Apple, Grapes, Apple, Apple, Banana, Apple, Apple, Grapes, Orange, Apple, Apple, Banana, Strawberries, Apple, Apple, Grapes, Apple, Orange, Apple, Apple, Apple, Apple, Grapes, Grapes, Apple, Orange, Apple, Apple, Banana, Apple, Apple, Apple, Strawberries, Apple, Orange, Grapes, Grapes, Apple, Grapes, Grapes, Grapes, Banana, Grapes, Banana, Apple, Banana, Grapes, Apple, Banana, Strawberries, Banana, Apple, Orange, Grapes, Orange, Grapes, Apple, Orange.

Use the results of this opinion poll to estimate, with 95% confidence, the actual percentage of children attending Tahoe Elementary School whose favorite fruit to eat is Grapes. Express the estimate both symbolically and verbally.

**Problem 5**

The National Association of Theatre Owners wanted to determine if there was a difference in the average ticket price at movie theatres in California and New York. So, they commissioned a study that randomly sampled 35 movie theatres in California and 35 movie theatres in New York. For the California sample, the mean ticket price was \$8.12 with a standard deviation of \$1.76. For the New York sample, the mean ticket price was \$12.28 with a standard deviation of \$2.04.

What determination should the National Association of Theatre Owners reach at the 0.01 level of significance?

**Problem 6**

Sierra College is considering the option to include plus and minus in the school's letter grading system. An opinion poll was conducted on campus in order to gauge the reaction to this proposed change in the college's grading system. As a result, 58.7% of the 167 students polled and 43.4% of the 83 teachers polled were in favor of including plus and minus in the school's letter grading system.

Estimate the difference in the percentage of students and teachers on campus who are in favor of including plus and minus in the school's letter grading system. Express the estimate both symbolically and verbally.