

Math 1431
Summer 2003 –Test #4

Name _____

You are allowed to use your calculator. Explain all answers – answers with no explanation will receive only partial credit. Use complete sentences. Show how you used the calculator to answer the questions below. For each question, note which test on TI83 you used to find the answer. Show all steps for hypothesis tests!

1. (20 points) Two randomly selected bags of m&ms had the following contents:

	Red	Blue	Green	Brown	Yellow	Orange
Bag 1	21	4	6	14	4	8
Bag 2	15	7	12	15	4	5

- Is there enough evidence that Bag 2 has a significantly higher proportion of green m&ms than Bag 1 at the 10% significance level?
 - Is there enough evidence that Bag 2 has a significantly different proportion of green m&ms than Bag 1 at the 10% significance level?
 - Check the assumptions that the test is valid.
 - Give a 95% CI for the difference in the proportions of green m&ms.
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2. (25 points) Here are randomly selected test scores from section 01 of calculus:

83	89	36	83	92	91	73	82	62	57
58	74	78	73	98	35	57	85	72	64

Here are randomly selected scores for the same test from section 02 of calculus:

74	79	84	49	38	85	64	68	93	76	81	61
58	73	79	83	88	91	48	19	92	78	86	82

- Draw a stemplot for the test scores of each section.
 - Is there enough evidence that section 01 performed worse than section 02 on the test?
 - Is there enough evidence that the test scores were different for the two sections?
 - Check the assumptions that the test is valid.
 - Give a 99% CI for the difference in the mean test scores.
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3. (10 points) A study was done to determine if temperature affects the hatching of snake eggs. The eggs in the study were randomly selected. Here are the data:

	Eggs	Hatched
Cold	27	16
Neutral	56	38
Hot	104	75

- Are there significant differences among the proportion of eggs that hatched in the three groups?
- Check the assumptions that the test is valid.

4. (15 points) An experiment on the side effects of pain relievers assigned patients randomly to one of several over-the-counter pain medications. Of the 385 patients who took one brand of pain reliever, 25 suffered some “adverse symptom”.

- If 9% of all patients suffer adverse symptoms, what would be the sampling distribution of the proportion with adverse symptoms in a sample of 385 patients?
 - Is there strong evidence that fewer than 9% of patients who take this medication have adverse symptoms?
 - Find a 90% confidence interval for the proportion of patients who have adverse symptoms.
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5. (10 points) A major study of alternative weight-loss programs was undertaken. The individuals in the study were randomly placed into one of the two programs. Here is the information released by the researchers:

	n	mean weight loss	standard deviation
Program 1	1362	15	3.5
Program 2	1295	13	3.8

Is there good evidence that there is a difference in weight loss between the two programs?

SHORT ANSWERS:

- (5 points) Show how to find the expected value for any one of the cells in problem #3.
- (5 points) What is the definition of the chi-square statistic?