Math 21 Final Review #1 – Fall 2012

1. A nutritionist has developed a diet that she claims will help people lose weight. Twelve people were randomly selected to try the diet. Their weights were recorded prior to beginning the diet and again after 6 months. Here are the original weights, in pounds, with the weight after 6 months in parentheses.

Before	192	212	171	215	180	207	165	168	190	184	200	196
After	183	196	174	211	160	191	162	175	190	179	189	195

   Test the claim that the diet is effective at the 0.05 level of significance.

2. How many commercials do Americans watch in their entirety during the Super Bowl? A random sample of 16 Americans reported watching a mean of 15.3 commercials, with a standard deviation of 5.72 commercials. Construct a 95% confidence interval for the mean number of commercials watched by all Americans during the Super Bowl.

3. A sample of 100 male drivers showed an annual mean of 10230 miles driven per year, with a standard deviation of 2870 miles. A similar sample of 28 female drivers showed an annual mean of 9660 miles driven per year, with a standard deviation of 2900 miles. Test the claim that the mean number of miles driven by male drivers is greater than the mean number of miles driven per year by female drivers at the 0.05 level of significance.

4. What proportion of all drivers turn on their headlights while driving in the rain? A sample of 200 vehicles on a rainy day showed that 41 had their headlights turned on. Test the claim that less than 25% of all drivers turn on their headlights while driving in the rain at the 0.01 level of significance.

5. A sample of 2000 Americans revealed that 226 of them watched the Tonight Show last night. Construct a 99% confidence interval for the proportion of all Americans who watched the Tonight Show last night.

6. A sample of 38 60-year-old smokers revealed that 10 of them have suffered with some sort of heart disease. A sample of 162 60-year-old nonsmokers showed that 12 of them have suffered with some sort of heart disease. At the 0.01 level of significance, test the claim that nonsmokers are less likely to suffer with some sort of heart disease by the time they turn 60 years old.

7. At a two-year college, 5 people were picked from each of the following three groups: faculty, administrators, and students. Each person was asked to count the number of Spam email messages they received that day.

Faculty	Administrators	Students
8	2	21
13	4	15
12	3	18
7	4	23
19	8	16

Test the claim that the mean number of Spam email messages received per day is the same for the three different groups at the 0.05 level of significance.

8. At a community college, students can get into an intermediate algebra class by either passing a placement test or by passing the prerequisite course (beginning algebra). Using the following sample information, test the claim that a student's grade the first time that the student takes intermediate algebra is independent of the way that the student qualified for the class at the 0.05 level of significance.

	Passed	Failed	Dropped
Placement Test	72	38	20
Prerequisite Class	81	30	9

9. A soft drink company makes three flavors of cola: Cola, Vanilla Cola, and Lime Cola. They claim that 65% of their customers prefer Cola, 25% prefer Vanilla Cola, and 10% prefer Lime Cola. A random sample of 280 people showed that 196 preferred Cola, 42 preferred Vanilla Cola, and 42 preferred Lime Cola. Test the company's claim at the 0.01 level of significance.

10. UPS monitors its trainees to see how fast they can work. A sample of 20 new employees handled a mean of 460.4 packages in one day, with a standard deviation of 38.83 packages. Test the claim that the mean number of packages handled per day by new employees is more than 450 packages, using the 0.05 level of significance.