1. A sample of size 24 has mean 65 and standard deviation 5.

   (a) Calculate the t statistic for this sample, assuming it is taken from a population with mean 60.

   (b) What are the degrees of freedom

   (c) The alternative hypothesis is that the sample is taken from a population whose mean differs from 60. Is a one-tailed or two-tailed test appropriate to test this hypothesis? Can you reject the null hypothesis at the 5% level of significance?. At the 1 % level?

2. A survey of recently graduated students who had taken out student loans revealed an average student debt of \$18900 with a standard deviation of \$49,000. Find the margin of error and the 95% confidence interval for the population mean if

   (a) The sample size was 1280.

   (b) The sample size was 320.

3. Some people claim that a full moon causes dementia patients to be more aggressive. A careful study measured the difference between the number of daily aggressive behaviors on "moon" days versus other days, and found a mean difference of 2.433 and standard deviation of 1.460 for a sample of 15 patients.

   (a) What is the null hypothesis for this problem. If μ is the expected mean difference in aggressive behaviors between "moon" days and other days if the null hypothesis is true, what is μ.

   (b) State an alternative hypothesis and test its validity using an appropriate significance test.