UNIVERSITY OF TEXAS AT AUSTIN

Problem Set # 8
Hypothesis testing: The normal case.

Problem 8.1. *Source: Ramachandran, Tsokos.*
The management of the local health club claims that its members lose on average 15 pounds or more within the first three months of their membership. A consumer agency took a simple random sample of 45 members and found the sample average of 13.8 in pounds lost. Assume that we model the weight loss as normal with an **unknown** mean μ and the **known** standard deviation of 4.2 pounds. What is the $p-$value corresponding to the gathered data? What would your decision be at the 0.05 significance level?

Problem 8.2. *Source: Ramachandran, Tsokos.*
It is claimed that sports-car owners drive on the average $20,000$ miles per year. A consumer firm believes that the mean annual mileage is actually <u>lower</u>. To check, the consumer firm decided to test this hypothesis.

The modeling assumptions are that the annual mileage is normally distributed with an unknown mean μ and with the standard deviation of 1200.

The consumer firm obtained information from 36 randomly selected sports-car owners that resulted in a sample average of $19,530$ miles. What is the decision of this hypothesis test at the signficance level of 0.01?