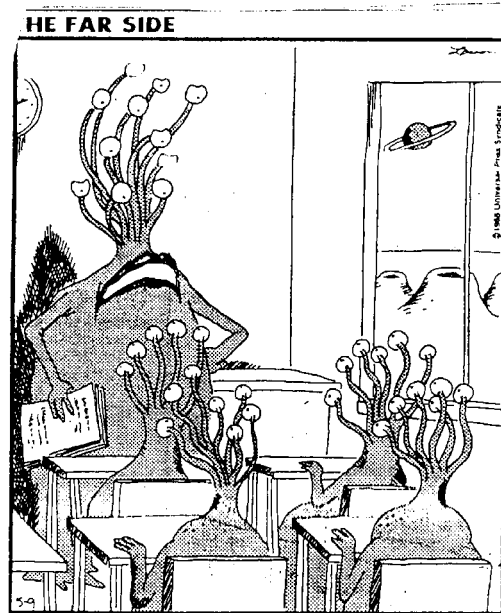


Okay, here's the drill. Read each question carefully. If the question is unclear, raise your hand and I will try to clarify any ambiguity. Answer each question completely. Be sure to show all your work. The point value of each question is indicated. I tend to think of a point as equal to a minute, so a 10 pt question should take you about 10 minutes. If you find a question to be taking you substantially longer than its point value, you should probably move on to the next question.

Be sure to keep your eyes focused on your own exam (see reminder below). Don't create any question in my mind about whether or not you are working independently of your neighbor. Of course, the Skidmore Honor Code is in effect for this exam. When turning in your exam you will be asked to sign a statement claiming that you adhered to the principles of the honor code. Good Luck!!!



"And one final warning before we begin the exam — any stray eyeballs will be immediately thumped."

1. Below is a sample of scores. Estimate the parameters of the population from which the sample was drawn. [5 pts]

- 2
- 2
- 3
- 4
- 4

2a. What is the Central Limit Theorem and why is it important for the sampling distribution of the mean? [3 pts]

3a. As you know, gestation periods are normally distributed with $\mu = 268$ and $\sigma = 16$. Imagine that you are giving a talk to 64 pregnant women who happen to be cigarette smokers. Suppose that you want to tell them what the average (mean) gestation period would be for a group that size and you want to be 90% confident in your estimate. What would you tell them about the upper and lower limits that would encompass the typical mean gestation period for a group of 64 women? (In other words, what gestation periods cut off the upper and lower 5% of the distribution?) [10 pts]

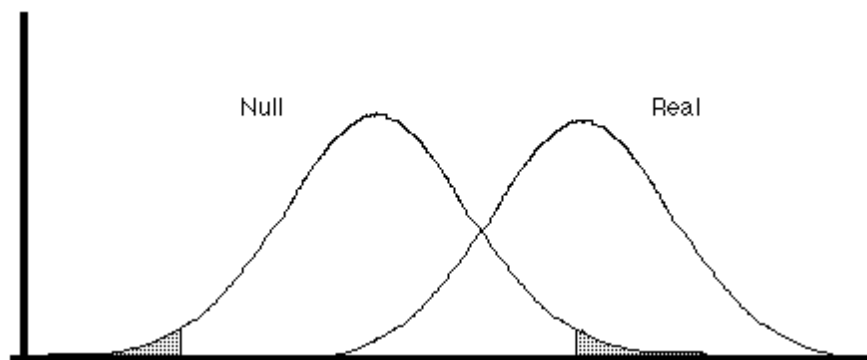
3b. Suppose that for this sample of 64 smokers, mean gestation period = 260 days. How likely is it that your group was sampled from the normal distribution described in 3a?

State the null and alternative hypotheses you would be using to test the assertion. [1 pt]

Test the null hypothesis, then tell me what you would conclude (be explicit!!). [9 pts]

Tell me, in words, what kind of error you might be making in your conclusion. [2 pts]

On the curves seen below, label the areas that represent Type I Errors, Type II Errors, Power, and Correct "Acceptance." [5 pts]



4a. SAT scores are normally distributed with $\mu = 500$ and $\sigma = 100$. What is the probability that a person would receive an SAT score between 350 and 450? [5 pts]

4b. What is the probability that a person would receive an SAT score less than 550? [5 pts]

4c. The upper 20% of people taking the SAT would receive what scores? [5 pts]