

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. 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!!!

1. You are dealing with a negatively skewed distribution. [10 pts]
 - a. First, sketch what a negatively skewed distribution look like:

 - b. Which score is smaller (lower), the mean or the mode?
 - c. Which score is smaller (lower), the median or the mode?

You next convert all the scores in this negatively skewed distribution to z-scores.

- d. What is the mean of this distribution of z-scores?
 - e. What is the standard deviation of this distribution of z-scores?
 - f. What would be the shape of the distribution of z-scores?
 - g. What percentage of the scores would be above a z-score of 0?

2. Below is a sample of scores. Estimate the parameters of the population from which the sample was drawn. [10 pts]

- 1
- 2
- 3
- 4
- 5

3. As you know, gestation periods are normally distributed with $\mu = 268$ and $\sigma = 16$. If you were pregnant (males should use their imaginations, a la Arnold's movie)

a. What would be the probability that you would carry your child between 276 and 300 days (i.e., what percentage of women carry their children between 276 and 300 days)? [5 pts]

b. Suppose that you figure that you're pretty normal, so that your gestation period would also be fairly normal. You presume that you will be like 90% of the women in the world, so you'd like to know the range of gestation periods you would likely encounter. What gestation periods bound the upper and lower 90% of the population? (In other words, what gestation periods cut off the upper and lower 5% of the distribution?) [5 pts]

4. SAT scores are normally distributed with $\mu = 500$ and $\sigma = 100$. You are interested in knowing if Skidmore students have typical SAT scores (i.e., they are sampled from the normal distribution of SAT scores). To test this assertion, you collect a random sample of $n = 25$ Skidmore students. Your sample mean is 530.

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

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

c. Tell me, in words, what kind of error you might be making in your conclusion. [5 pts]

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

