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Exam 1

PS 217, Spring 2002

As always, the Skidmore Honor Code is in effect. Answer each question completely, and show all your work so that I can give you partial credit (if needed). I tend to think of a point as a minute, so (for example) you should not spend 20 minutes on a 10-point question, or else you are unlikely to complete the exam. Good luck!

1. Suppose that you take one sample of $n = 16$ and another sample of $n = 100$. What does the Central Limit Theorem tell you about the means of those two samples, relative to the sampling distribution of the mean from which each sample mean would have been drawn? [5 pts]

2. SAT Math scores are thought to be normally distributed with $\mu = 500$ and $\sigma = 100$. [15 pts]

a. What is the probability of getting a Math SAT score between 520 and 580?

b. What Math SAT scores comprise the top 10%?

c. What is the probability of 25 people taking the Math SAT and receiving a mean SAT between 500 and 540?

3. The GPAs for a sample of students are seen below. Using these data, estimate the parameters of the parent population from which the sample was drawn. [10 pts]

3.5

2.9

3.2

3.0

2.7

3.6

3.1

2.9

3.0

4. Educators often talk about grade inflation. Suppose that the mean GPA in 1950 was 2.4 (i.e., $\mu = 2.4$). How likely is it that the sample above (problem 3) was drawn from a population with $\mu = 2.4$? What might this evidence say about grade inflation? [10 pts]

5. For the following questions, only a simple answer is required...and no computation should be needed. [5 pts]

a. $\sum(X - \bar{X}) =$

b. Suppose that a sample standard deviation (s) is 10. Next, suppose that you add 5 to every score in the sample. The standard deviation of the sample would now be:

c. Suppose that a sample standard deviation (s) is 10. Next, suppose that you convert every score in the sample to a z-score. The standard deviation of this distribution would be:

d. Suppose that the mean of a sample of n=25 is 5. Generally speaking, if you add another score (new n=26), the variability of the sample (s^2 or s) would increase. However, there is one score you could add to the sample without increasing its variability. That would be

e. The probability of making a Type I Error is typically set to %.

6. Use the StatView output below to answer the following questions. [5 pts]

One Sample t-test

Hypothesized Mean = 50

	Mean	DF	t-Value	P-Value
Approval Ratings	48.857	27	-.360	.7215

a. What was H_0 ?

b. How many scores were involved in the analysis?

c. What decision should you reach regarding H_0 , given this output?