#25

Claim: Mean score of students who take the Prep course is higher than 515.

$H_0: \mu = 515$

$H_1: \mu > 515$

$Z = 1.66$

P-value of .049

Reject H_0

The Sample data support the claim that the mean score of students who complete the prep course is higher than 515.

— Skip b; C for now.

Hypothesis Tests About a Mean (σ known) (8.4)

25.[*]   **Math SAT:** The SAT tests were originally designed to have a mean of 500 and a standard deviation of 100. The mean math SAT score last year was 515 but the standard deviation was not reported. You read in an article for an SAT prep course that states in a sample of 76 students, the mean math score was 534, but they did not disclose the standard deviation.

(a) Assume the population standard deviation (σ) for all prep course students is 100 and test the claim that the mean score for prep course students is above the national average of 515. Use a 0.05 significance level.

(b) Assume now that we don't know σ but we do know the sample standard deviation (s) for the 76 prep course students was 100 and test the claim that the mean score for prep course students is above the national average of 515. Use a 0.05 significance level.

(c) Compare your two different answers. Why do they disagree?

26. **Salmon:** Assume that the weights of spawning Chinook Salmon in the Columbia River are normally distributed with a population standard deviation (σ) of 4.5 pounds. You randomly catch and weigh 20 such salmon. The mean weight from your sample is 25.2 pounds. We did this problem earlier in this problem set while assuming that the **sample standard deviation** was 4.5 pounds. We now assume the **population standard deviation** is 4.5 pounds.

(a) Test the claim that the mean weight of Columbia River salmon is greater than 23 pounds. Use a 0.10 significance level.

(b) Test the same claim at the 0.05 significance level.

(c) Test the same claim at the 0.01 significance level.

(d) We did similar tests in problem # 18 only we did not know the population standard deviation. How do the results from that problem compare to the results obtained in this problem?

n = 20 $\sigma = 4.5$ (a) Reject Ho

$\bar{X} = 25.2$ (b) Reject Ho.

Claim see above.   (c) Fail to reject Ho.

$H_0: \mu = 23$

$H_1: \mu > 23$

$Z = 2.15$ P-value .014