Math 373 Hw 19 Name ________________________________ Score ______/ 12

Hw 336: 9.4, 9.11′. Rec 336: 9.1, 9.7, 9.9, 9.11.

Page 336. *Write acceptance regions in the format below:*

$x \in 10 \pm (1.96)(.5) = [9.02, 10.98]$

or $\overline{x} \in [10-(1.645)(.5), \infty) = [9.18, \infty)$

or $\overline{x} \in (-\infty, 10+(1.645)(.5)] = (-\infty, 10.83]$

9.4(5). A random sample of $n=35$ observations from a quantitative population produces a mean of $\overline{x}=2.4$ with std. dev. $s=.29$. Suppose your research objective is to show, at the 5% significance level, that the population mean μ exceeds 2.3 .

$H_a: \mu > 2.3$, $H_0: \mu \le 2.3$, hence $\mu_0 = 2.3$.

(a) Find the null region (include variable μ).

Find the acceptance region (write in both forms, include $\overline{x}$).

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(b) Suppose the alternate value is $\mu_a = 2.4$. Find the probability β of falsely accepting H_0.

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(c) Same as (b) but with alternate value $\mu_a = 2.5$.

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(c′) Same as (b) but with alternate value $\mu_a = 2.6$.

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(e) As the distance between μ_0 and μ_a increases what happens to value of β?

increases? decreases?

9.11′(7). A drug manufacturer claims that one of its drugs has an average potency of 70%. A random sample of $n = 100$ capsules are tested and found to have a sample mean of $\overline{x}$ = 68% with std. dev. s = .8%. You wish the level of significance to be 5%.

(a) $\mu_0 =$ H_0: H_a:

(b) SE= . _ _% $z_{\alpha/2} =$

SE = $\sqrt{\frac{pq}{n}}$ or $\frac{\sigma}{\sqrt{n}}$?

(c) Find the null region.

Find the acceptance region (both forms with 4-place decimals, e.g., .5831 for 58.31%).

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(d) What is the p-value of the sample mean x = 68%?

(e) Do the data present sufficient evidence to refute the manufacturer's claim at the 5% significance level?

(f)(2) If the alternate value is $\mu_a = 66\%$, find β.

As part of the calculation of β, draw a picture like that of the lecture. Correctly picture $\mu_a \in (-\infty, a_1]$, or $\in [a_1, a_2]$ or $\in [a_2, \infty)$