Exam 3 for Introductory Statistics

Prof. Bernardo Ábrego Math 140, Spring 2006

Name._____05/04/06

Problem	Out of	Points
1	16	
2	18	
3	22	
4	22	
5	22	
Total	100	

Directions.

- You have 1 hour and 50 minutes to complete the test.
- You can use a 3"×5" card with notes, your calculator, and the z-tables provided on the back of this test. No other materials are allowed.
- No scratch paper is permitted. For this purpose or in case you need more space you can use the back of the pages of the test.

1. A recent study of 100 people in Miami found 27 were obese. Find the 99% confidence interval of the population proportion of individuals living in Miami who are obese.

2. A university dean of students wishes to estimate with 95% confidence the average number of hours students spend doing homework per week. It has been estimated that the population standard deviation is about 6.2 hours. How large a sample must be selected if he wants to be accurate within 1.5 hours?

Use the following three pages to conduct the following significance tests.

3. The Medical Rehabilitation Education Foundation reports that the average cost of rehabilitation for stroke victims is \$24,672. To see in the average cost of rehabilitation is different at a particular hospital, a researcher selects a random sample of 35 stroke victims at the hospital and finds that the average cost of their rehabilitation is \$25,226. The standard deviation of the population is \$3251. At $\alpha = 0.01$, can it be concluded that the average cost of stroke rehabilitation at a particular hospital is different from \$24,672?

4. A nationwide survey of large U.S. cities finds that the average commute time one way is 25.4 minutes. A chamber of commerce executive feels that the commute in his city is less and wants to publicize it. He randomly selects 25 commuters and finds the average is 22.1 minutes, with a standard deviation of 5.3 minutes. At $\alpha = 0.10$, is he correct?

5. In a sample of 80 workers from a factory in city A, it was found that 8 were unable to read, while in a sample of 50 workers in city B, 6 were unable to read. Can it be concluded that there is a difference in the proportions of nonreaders in the two cities? Use $\alpha = 0.05$.

Problem 3.

Identify the test (circle one):

1. Significance test for one proportion (1-PropZTest)
2. Significance test for the difference of two proportions (2-PropZTest)
3. Significance test for a mean when σ is known (Z-Test)
4. Significance test for the difference of two means when σ_1 and σ_2 are known (2-SampZTest)
5. Significance test for a mean when σ is unknown (T-Test)
6. Significance test for the difference of two means when σ_1 and σ_2 are unknown (2-SampTTest)

Data: Significance level $\alpha =$ _____

Other: (depending on the test, circle and give the necessary values)

$p_0 =$ _____	$\hat{p} =$ _____	$\overline{x} =$ _____
$\mu_0 =$ _____	$\hat{p}_1 =$ _____	$\overline{x}_1 =$ _____
$n =$ _____	$\hat{p}_2 =$ _____	$\overline{x}_2 =$ _____
$n_1 =$ _____	$\sigma =$ _____	$s =$ _____
$n_2 =$ _____	$\sigma_1 =$ _____	$s_1 =$ _____
	$\sigma_2 =$ _____	$s_2 =$ _____

Check the conditions:

1.

2.

3.

State the hypotheses:

H_0 :

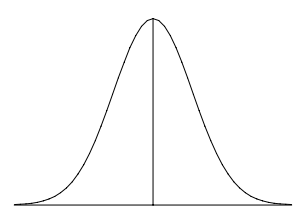
H_a :

where (circle and describe in words the appropriate symbol(s): $p, p_1, p_2, \mu, \mu_1, \mu_2$)

Compute the test statistic, p-value, and label and complete the sketch:

Test statistic: $\boxed{}$ = _____

formula



P-value = _____

Is the sample significant? _____

Yes/No

Conclusions:
(Circle one) We reject/don't reject the null hypotesis.
Explain in context.

Problem 4.

Identify the test (circle one):

1. Significance test for one proportion (1-PropZTest)
2. Significance test for the difference of two proportions (2-PropZTest)
3. Significance test for a mean when σ is known (Z-Test)
4. Significance test for the difference of two means when σ_1 and σ_2 are known (2-SampZTest)
5. Significance test for a mean when σ is unknown (T-Test)
6. Significance test for the difference of two means when σ_1 and σ_2 are unknown (2-SampTTest)

Data: Significance level $\alpha =$ _____

Other: (depending on the test, circle and give the necessary values)

$p_0 =$ _____	$\hat{p} =$ _____	$\overline{x} =$ _____
$\mu_0 =$ _____	$\hat{p}_1 =$ _____	$\overline{x}_1 =$ _____
$n =$ _____	$\hat{p}_2 =$ _____	$\overline{x}_2 =$ _____
$n_1 =$ _____	$\sigma =$ _____	$s =$ _____
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Check the conditions:

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State the hypotheses:

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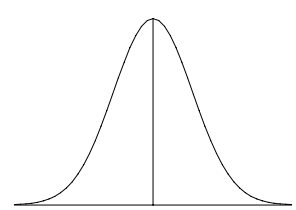
Compute the test statistic, p-value, and label and complete the sketch:

Test statistic: $\boxed{}$ = _____

formula



P-value = _____

Is the sample significant? _____

Yes/No

Conclusions:
(Circle one) We reject/don't reject the null hypotesis.
Explain in context.

Problem 5.

Identify the test (circle one):

1. Significance test for one proportion (1-PropZTest)
2. Significance test for the difference of two proportions (2-PropZTest)
3. Significance test for a mean when σ is known (Z-Test)
4. Significance test for the difference of two means when σ_1 and σ_2 are known (2-SampZTest)
5. Significance test for a mean when σ is unknown (T-Test)
6. Significance test for the difference of two means when σ_1 and σ_2 are unknown (2-SampTTest)

Data: Significance level $\alpha =$ _____

Other: (depending on the test, circle and give the necessary values)

$p_0 =$ _____	$\hat{p} =$ _____	$\overline{x} =$ _____
$\mu_0 =$ _____	$\hat{p}_1 =$ _____	$\overline{x}_1 =$ _____
$n =$ _____	$\hat{p}_2 =$ _____	$\overline{x}_2 =$ _____
$n_1 =$ _____	$\sigma =$ _____	$s =$ _____
$n_2 =$ _____	$\sigma_1 =$ _____	$s_1 =$ _____
	$\sigma_2 =$ _____	$s_2 =$ _____

Check the conditions:

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State the hypotheses:

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Compute the test statistic, p-value, and label and complete the sketch:

Test statistic: $\boxed{}$ = _____

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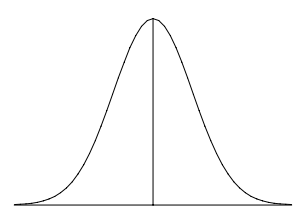

P-value = _____

Is the sample significant? _____

Yes/No

Conclusions:
(Circle one) We reject/don't reject the null hypotesis.
Explain in context.