Name:_____ ch 7.1-7.4 Review worksheet

1. Hint

Identify the null hypothesis H_0 and the alternative hypothesis H_1. Use μ for a claim about a mean, p for a claim about a proportion, and σ for a claim about variation.

The owner of a football team claims that the average attendance at games is over 82,100, and he is therefore justified in moving the team to a city with a larger stadium.

- H_0: μ, the average attendance at games, is less than or equal to 82,100
  H_1: μ, the average attendance at games, is greater than 82,100
- H_0: μ, the average attendance at games, is greater than 82,100
  H_1: μ, the average attendance at games, is less than or equal to 82,100
- H_0: μ, the average attendance at games, is greater than or equal to 82,100
  H_1: μ, the average attendance at games, is less than 82,100
- H_0: μ, the average attendance at games, is less than 82,100
  H_1: μ, the average attendance at games, is greater than or equal to 82,100

2. Hint

Assume that the data has a normal distribution and the number of observations is greater than fifty. Find the critical z value used to test a null hypothesis.

$\alpha = 0.03$ for a two-tailed test.

- ±1.953
- ±2.052
- ±2.17
- ±2.33

3. Hint

Formulate the indicated conclusion in nontechnical terms. Be sure to address the original claim.

A psychologist claims that more than 37 percent of the population suffers from professional problems due to extreme shyness. Assuming that a hypothesis test of the claim has been conducted and that the conclusion is failure to reject the null hypothesis, state the conclusion in nontechnical terms.

- There is not sufficient evidence to support the claim that the true proportion is greater than 37 percent.
- There is sufficient evidence to support the claim that the true proportion is greater than 37 percent.
- There is sufficient evidence to support the claim that the true proportion is less than 37 percent.
- There is not sufficient evidence to support the claim that the true proportion is less than 37 percent.

4. Hint

Assume that a hypothesis test of the given claim will be conducted. Identify the type I or type II error for the test.

Carter Motor Company claims that its new sedan, the Libra, will average better than 28 miles per gallon in the city. Identify the type I error for the test.

- The error of rejecting the claim that the true proportion is more than 28 miles per gallon when it really is more than 28 miles per gallon.
- The error of failing to reject the claim that the mean is at most 28 miles per gallon when it is actually greater than 28 miles per gallon.
- The error of rejecting the claim that the mean is at most 28 miles per gallon when it really is at most 28 miles per gallon.

5. Hint

Assume that a hypothesis test of the given claim will be conducted. Identify the type I or type II error for the test.

The owner of a football team claims that the average attendance at games is over 59,600, and he is therefore justified in moving the team to a city with a larger stadium. Identify the type II error for the test.

- The error of rejecting the claim that the mean attendance is at most 59,600, when it really is at most 59,600.
- The error of failing to reject the claim that the mean attendance is at most 59,600, when it is actually greater than 59,600.
- The error of failing reject the claim that the mean attendance is more than 59,600, when it is actually less than 59,600.

6. Hint

Use the given claim and test statistic to find the P-value.

Claim: The mean test score is greater than 75.

Test statistic: $z = 1.47$

- 0.0708
- 0.8584
- 0.1416
- 0.9292

7. Hint

Determine the decision criterion for rejecting the null hypothesis in the given hypothesis test; i.e., describe the values of the test statistic that would result in rejection of the null hypothesis.

A chicken farmer in Grayslake claims that his chickens have a mean weight of 58 ounces. The farmer takes a random sample of 36 chickens and finds a mean weight of 59.2 ounces and a standard deviation of 3 ounces. In a hypothesis test, what criterion would be used for rejecting the farmer's claim at the 10 percent level of significance?

- Reject H_0 that $\mu = 58$ ounces if test statistic > 1.645 or < -1.645.
- Reject H_0 that $\mu = 58$ ounces if test statistic > 1.28 or < -1.28.
- Reject H_0 that $\mu = 58$ ounces if test statistic > 1.645.
- Reject H_0 that $\mu = 58$ ounces if test statistic > 1.28.

8. Hint

Compute the value of an appropriate test statistic for the given hypothesis test.

You wish to test the claim that $\mu = 65$ at the $\alpha = 0.01$ significance level. In a sample of $n = 101$, the sample mean is 66 and the standard deviation is 18. Compute the value of the test statistic.

- $z = 0.06$
- $z = 5.61$
- $z = 0.56$
- $z = -0.56$

9. Hint

Solve the problem.

In tests of a computer component, it is found that the mean time between failures is 937 hours. A modification is made which is supposed to increase reliability by increasing the time between failures. Tests on a sample of 36 modified components produce a mean time between failures of 983 hours, with a standard deviation of 52 hours. At the 0.01 level of significance, test the claim that for the modified components, the mean time between failures is greater than 937 hours.

- Reject the null and accept the claim that for the modified components, the mean time between failures is greater than 937 hours.
- Accept the null and reject the claim that for the modified components, the mean time between failures is greater than 937 hours.

10. Hint

Solve the problem.

A researcher claims that the mean systolic blood pressure amongst a particular population is greater than 125 mmHg. In a hypothesis test with an alternative hypothesis of H_1: $\mu > 125$ mmHg, what is the smallest possible value of the sample mean above 125 mmHg which would support the claim that the mean is greater than 125 mmHg? Use a significance level of 0.05. The sample standard deviation is 17.4 and the sample size is 57.

- 129.52
- 153.62
- 127.95
- 128.80

11. Hint

Find the critical t value or values for the given hypothesis, sample size, and significance level.

H_0: $\mu \leq 53.3$
$n = 11$
$\alpha = 0.01$

- -2.718
- 2.718
- 2.764

12. Hint

Should the statistician use a t distribution, a normal distribution, or neither to test the null hypothesis?

In a study of monthly incomes, $\bar{x} = 4070$, $\sigma = 1980$, $n = 7$. The data has a slight skew to the right. The null hypothesis is: $\mu = 4477$.

- Neither
- Normal distribution
- t distribution

13. Hint

What decision rule should you use to test H_0?

A conservative think tank reported that the tax burden on citizens in the northeastern states is significantly different from the 32% of income norm for all states. They used a sample of six northeastern states.
H_0: $\mu = 0.32$. Use a 99% confidence level.

- Reject H_0 if P-value of $\frac{\bar{x} - 0.32}{s/\sqrt{6}} < 2.33\%$.
- Reject H_0 if $\bar{x} \pm 2.61s/\sqrt{5}$ includes 0.32.
- Reject H_0 if $0.32 \pm 3.12s/\sqrt{6}$ excludes $\bar{x}$.
- Reject H_0 if P-value of $\frac{\bar{x} - 0.32}{s/\sqrt{6}} \leq .01$.

14. Hint

Compute the value of an appropriate test statistic for the given hypothesis test.

A mathematics professor wishes to test the claim that the mean test score for his students is 75. He selects one of his classes at random, and the final exam scores were as follows.
79 74 82 74 78 73 79 75 78 89
74 84 66 82 84 82 71 82 72 83
If the sample mean = 78.1 and sample standard deviation = 5.60, what is the value of the appropriate test statistic?

- 1.4776
- 2.4756
- 11.0802
- .4429