MATH 3307

Test Review 3

10 multiple choice questions, worth 60 points.

4 free response questions, worth 40 points.

A study is conducted to determine the difference in mean starting income between trade school graduates and college graduates. A 99% confidence interval was created, yielding a result of [1200, 2000].

Which of the following can be determined from this:

- Which sample had the larger income.
- Which sample had the larger sample size.
- Whether sample or population standard deviation was known.
- The difference in the sample means.
- The margin of error in the difference of the sample means.

A two-sample z-test for proportions was performed to determine the difference in proportions for two samples with the result being [0.02, 0.06]. Determine the difference of the sample proportions and the margin of error.

A study was conducted with to determine the percentage of adults that have more than one job. A 99% confidence interval of [0.35, 0.50] was created. Describe the meaning of this interval.

A simple random sample of 10 students was selected to determine their commuting distance. The results are as follows:
35 23 12 25 30 19 22 31 27 24

Determine the 95% confidence interval for the true population mean.

A simple random sample of 1000 students was selected to determine if they worked full-time while attending college full-time. Of the 1000 students 722 reported working full time. Determine the 90% confidence interval for the population proportion.

If the p-value in is larger than the confidence level, the researcher should (a) Accept the H_o, (b) Reject the H_o, (c) Fail to Reject the H_o, (d) Accept the H_a

You have created a confidence interval. When repeating the study, the width of the confidence interval has decreased. Which of the following may be also true:

- The confidence level has decreased.
- The sample size has decreased.
- The sample parameter has increased
- The margin of error has decreased.
- The standard deviation or standard error has increased.

A population has a standard deviation of 0.03. You are selecting a sample to find the population mean with a confidence level of 95%. How large of a population should you select if you want a margin of error less than 0.004?

You run an experiment to test where Ho: $\hat{p}$ = 0.34 and Ha: $\hat{p}$ ≠ .34. The value of your test statistic is z = 1.54. Determine the p-value.

A cereal company claims that their marshmallow cereal contains the following shapes:

star	20%
heart	25%
diamond	15%
circle	35%
tree	5%

An actual box of cereal contained the following pieces:

star	212
heart	310
diamond	155
circle	223
tree	73

Use a $\chi 2$ Goodness of Fit Test to confirm the validity of the company's claim at a 10% significance level.

To determine the effectiveness of a video about traffic accidents on a group of new drivers, 100 new drivers had their maximum speed recorded while driving before and after the presentation. The mean difference was a decrease of 2.4 mph of speed with a standard deviation of 1.2. Determine if the video was effective at a 5% significance level.

- State the null and alternate hypothesis.

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- Determine the rejection region.

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- Calculate the Test Statistic.

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- State your conclusion.

A prep school claims that 85% of their graduates are accepted to Ivy League schools. You believe that the proportion is less than that. To investigate, you find an SRS of 350 of their graduates and discover that 265 of them were accepted into Ivy League schools. We will test the claim at a 2% significance level.

- State the null and alternate hypothesis:

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- Sketch and state the rejection region.

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- Calculate the test statistic.

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- Determine the p-value for your test.

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- State your conclusion.

A study shows that a family of four, on average, spends $255 per week on groceries. You believe that this amount is incorrect. To test your hypothesis, you select 35 local families of four and calculate their average grocery budget to be $295 with a standard deviation of $12.3 Test this claim using a significance level of 5%.

- State your null and alternate hypothesis

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- Calculate your p-value.

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- Draw your conclusion.