

9.5 Full Hypothesis Testing with One Sample

Section 9.5 Full Hypothesis Testing with One Sample

Learning Objective:

In this section, you will:

- Interpret real-world problems and apply the five-step process of hypothesis testing to make statistical conclusions
- Apply the process to problems concerning a single proportion, and a mean (with σ known and unknown)

Testing a claim about a proportion: Use TI-84 calculator 5:1-PropZTest

Example 1: In a poll of 745 randomly selected adults, 591 said that it is morally wrong to not report all income on tax returns. Use a 0.01 significance level to test the claim that 75% of adults say that it is morally wrong to not report all income on tax returns.

1. Null and Alternative Hypothesis
2. Calculator Work
3. Test Statistic and P-Value
4. Conclusion about the null hypothesis
5. Final conclusion that addresses the original claim

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Example 2: A recently televised broadcast of *60 minutes* had a 15 share, meaning that among

5000 monitored households with TV sets in use, 15% of them were tuned to *60 minutes*. Use a 0.05 significance level to test the claim of an advertiser that among the household with TV sets in use, less than 20% were tuned to *60 minutes*.

1. Null and Alternative Hypothesis
2. Calculator Work
3. Test Statistic and P-Value
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5. Final conclusion that addresses the original claim

Testing a claim about a mean if σ is unknown: Use TI-84 calculator 2:TTest

Example 3: A simple random sample of 25 filtered 100mm cigarettes is obtained and the tar content of each cigarette is measured. The sample has a mean tar content of 13.2 mg and a standard deviation of 3.7 mg. Use a 0.05 significance level to test the claim that the mean tar content of filtered 100 mm cigarettes is less than 21.1 mg. Unfiltered king size cigarettes have a mean tar content of 21.1 mg.

1. Null and Alternative Hypothesis
 2. Calculator Work
- 2
3. Test Statistic and P-Value
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Example 4: The National Highways Traffic Safety Administration conducted crash tests of child booster seats for cars. Listed below are results from those tests, with the measurements given in hic (standard head injury condition units). The safety requirement is that the hic measurement should be less than 1000 hic. Use a 0.01 significance level to test the claim that the sample is from a population with a mean less than 1000 hic.

774 649 1210 546 431 612

1. Null and Alternative Hypothesis
2. Calculator Work
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Testing a claim about a mean if σ is known: Use TI-84 calculator 1:ZTest

Example 5: A simple random sample of 40 salaries of NCAA football coaches has a mean of \$415,953. The standard deviation of all NCAA football coaches is \$463,364. Use a 0.05 significance level to test the claim that the mean salary of a football coach in the NCAA is less than \$500,000.

1. Null and Alternative Hypothesis
2. Calculator Work
3. Test Statistic and P-Value
4. Conclusion about the null hypothesis
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Example 6: A simple random sample of FICO scores is listed below. The mean FICO score is reported to be 678. Assuming that the standard deviation of all FICO scores is known to be 58.3, use a 0.01 significance level to test the claim that these sample FICO scores come from a population with a mean equal to 678.

714 751 664 789 818 779 698 836 753 834 693 802 1) Null and Alternative Hypothesis

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- 2) Calculator Work
- 3) Test Statistic and P-Value
4. Conclusion about the null hypothesis
5. Final conclusion that addresses the original claim

For more information and examples see online textbook OpenStax Introductory Statistics pages 514-530.

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