

Hypothesis Tests & Confidence Intervals Review Activity

Problem 1: State all the steps in a general Hypothesis Test

Problem 2: Briefly explain the two methods for making a decision in a Hypothesis Test

Use the following information to answer problem 3 on the next page

Calculator Functions (unordered!)

- χ^2 -GOF-Fit
- 2PropZTest
- TTest
- Anova
- PropZTest
- 2SampTInt
- 2PropZInt
- LinRegTTest
- TInterval
- 2SampTTest

Distribution Used (unordered!)

- F -distribution
- z -distribution (normal)
- χ^2 -distribution
- t -distribution (Student's t)

Notation for computing probability

- $\chi^2cdf(a, b, df)$, $df = k - 1$
- $tcdf(a, b, df)$, $df = n - 1$
- $normalcdf(a, b, \mu, \sigma)$
- $Fcdf(F_0, UB, df_{num}, df_{denom})$, $df_{num} = k - 1$, $df_{denom} = k * (n - 1)$

Two Proportions

- a. Hypotheses:

- b. Requirements:

- c. Type of distribution:

- d. Test Statistic:

- e. Calculator:

Two Means (Independent Sample)

- a. Hypotheses:

- b. Requirements:

- c. Type of distribution:

- d. Test Statistic:

- e. Calculator:

Two Means (Dependent Sample)

a. Hypotheses:

b. Requirements:

c. Type of distribution:

d. Test Statistic:

e. Calculator:

Mixed Review

Problem 4: For Each problem below:

- a. Determine whether you need a Hypothesis Test (HT) or Confidence Interval (CI)
 - i. If it is a HT, state both hypotheses
 - ii. If it is a CI, state the point estimate
- b. Determine which calculator function you need to use
- c. Quick practice: use your calculator to either state the conclusion of a hypothesis test or give the confidence interval (no work necessary!)

1. In a random sample of 360 women, 234 favored stricter gun control laws. In a random sample of 220 men, 132 favored stricter gun control laws. Test the claim that the proportion of women favoring stricter gun control laws is higher than the proportion of men favoring stricter gun control laws.

2. A survey of the mean age of PCC stats students was conducted by randomly surveying one student from each section of Stats 50. The following data were collected: 20, 25, 18, 19, 21, 19, 24, 20, 36, 19, 20, 20, 19, 22. Assume the underlying distribution is approximately normal. Construct a 95% confidence interval for the average age of a stats student (round the values of the interval to 1 decimal place)

3. A survey in the N.Y. Times Almanac finds the mean commute time (one way) is 25.4 minutes for the 15 largest US cities. The Austin, TX chamber of commerce feels that Austin's commute time is less and wants to publicize this fact. The mean for 35 randomly selected Austin, TX commuters is 22.1 minutes with a standard deviation of 5.3 minutes. At the $\alpha = 0.01$ level, test the claim that the Austin, TX commute is less than the mean commute time for the 15 largest US cities.

4. According to an education consultation agency, in 2011 at least 18% of high school students have used a personal tutor. An Introduction to Statistics class in Davies County, KY conducted a hypothesis test at the local high school to determine if the local high school's percentage was higher. One hundred fifty students were chosen at random and surveyed. Of the 150 students surveyed, 32 have used a personal tutor. Reproduce the hypothesis test and state the conclusions.

5. In a sample of 285 randomly selected PCC students it was found that 165 of them have a tattoo. Construct a 97% confidence interval estimate of the percentage of PCC students that have a tattoo (round the values of the interval to three decimal places).

6. In 2017, the total number of cows in California was estimated to be 1.735 million head, and milk production per cow per day was estimated at 7.3 gallons. An agricultural department official randomly samples the milk production of 50 cows at various farms throughout California and determines the mean production to be 7.1 gallons per day with a standard deviation of 0.3 gallons. Test the claim that the mean milk production per cow per day today is different from the 2017 level.