

SOLUTIONS TO

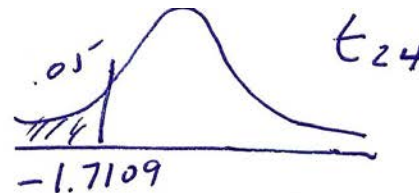
TEST YOUR KNOWLEDGE: The t-Distribution

1. A cereal company claims that there are at least 80 raisins in every box of its raisin bran. You decide to test the claim at a significance level (alpha) of .05. You randomly sample 25 boxes of cereal made by the company and find the sample mean to be 77.8 raisins with a sample standard deviation of 5.5 raisins.

- (a) What are the null and alternate hypotheses?
 (b) Draw the picture of the distribution of the test statistic (under H_0). Include critical value(s) and region(s) of rejection.
 (c) What is the calculated (computed) value of the test statistic?
 (d) What is your conclusion?

$$H_0: \mu \geq 80 \text{ raisins}$$

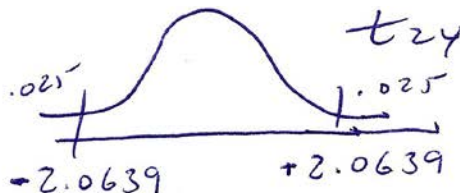
$$H_1: \mu < 80 \text{ raisins}$$



$$t_{24} = \frac{77.8 - 80}{5.5/\sqrt{25}} = \frac{-2.2}{1.1} = -2.00 \text{ reject } H_0$$

2. A researcher is interested in measuring the average job satisfaction score (0 = lowest and 100 = highest) among full-time faculty at a college. She randomly samples 25 professors and finds the average job satisfaction to be 48.4 with a standard deviation of 6.1. Assume that jobs satisfaction follows a normal distribution.

- (a) Using the above data, construct a 95% CIE for job satisfaction at this college.



$$48.4 \pm 2.0639 (6.1/\sqrt{25})$$

$$48.4 \pm 2.5$$

$$45.9 <=====> 50.9$$