

LAST NAME (Print): **KEY**

Statistics 111 **Quiz 16**

1. You want to show that listening to metal bands decreases life expectancy. Assume the average U.S. lifespan is 75 years with standard deviation 8 years. You want to prove your claim at the 0.05 level.

0.05 What is the probability of Type I error?

The probability of Type I error is α .

0.95 What is the probability that you fail to reject the null hypothesis when it is true?

The probability of not making a Type I error is $1 - \alpha$.

_____ A sample of 36 metalheads has an average lifespan of 72 years. What is your test statistic?

$$ts = \frac{72-75}{8/\sqrt{36}} = -2.25$$

_____ What is your P-value?

From the normal table, this is 0.0122.

In a clear sentence, what conclusion do you draw?

People who listen to metal have shorter lifespans.

2. Prof. Banks wants to show that students who take his class get salaries greater than \$62K. Of 10 students in a class of 20, the mean starting salary is \$65K with a sample sd of \$5K.

In words, what is his alternative hypothesis?

His students have starting salaries greater than \$62K.

_____ What is the test statistic?

$$t_s = \frac{65-62}{(5/\sqrt{10}) * FPCF} = 2.615 \text{ since the FPCF is } \sqrt{(20-10)/(20-1)} = 0.725.$$

t_9 What kind of critical value does he use? (Include df if necessary.)

A t_{10-1} value.

Between 0.01 and 0.025 What is his P-value? (Give a range if necessary.)

In words, what is his conclusion? Use $\alpha = 0.05$.

There is evidence that Professor Banks's students get average starting salaries greater than \$62K.