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Math 213

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# MATH 213 – Homework 17

1. From the Chapter 19 exercises: Question 8

Chart, histogram

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**The t distribution with 5 degrees of freedom is the solid unimodal and symmetric curve.**

**The t distribution with 1 degrees of freedom is the dashed unimodal and symmetric curve.**

**The standard z distribution is the dotted unimodal and symmetric curve.**

1. Recall that to compute a confidence interval for a population mean, we must use the t-distribution and the formula

We said in class on Friday, 4/22 that the value of varies depending on the confidence level and the sample size. In fact, we even had some R code that can compute the appropriate value of for us. For a 95% confidence interval, that R code was:

where df is easily calculated as one less than the sample size. In symbols, The reason for listing 0.975 is that that is the upper percentile for the middle 95% of the data.

Consider the following situation:

Gribbles are small, pale, white marine worms that bore through wood. They were once considered a pest, but now are being studied to understand if the enzyme they secrete can be used to turn inedible wood and other plant waste into biofuel.

A sample of 50 gribbles has an average length of 3.1mm with a standard deviation of 0.72.

1. What symbol do we use for the 50 mentioned above? **We use N for the 50 mentioned above.**
2. What symbol should we use to represent the 3.1? **We use** 𝑥̅ **to represent the 3.1.**
3. What symbol should we use to represent the 0.72? **We use S to represent the 0.72.**
4. Use R to compute the appropriate t\* value for a 95% confidence level. (You can start your own fresh R file, or you can open an existing project and type an extra line of code to get this output. Copy and paste your R work here.)

df= n -1

df= 50 -1

df 49

Graphical user interface, application

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1. By hand, compute a 95% confidence interval. Show all of your work. Use the value of t\* you computed in (d).

Se= S/sqrt(N)

Se=0.72/sqrt(50)

Se=0.10182

3.1 +-2.009575 \* (0.10182)

= **(2.8953, 3.3046)**

1. Write a sentence of interpretation for the confidence interval.

**We are 95% confident that** population mean of gribble’s length lies between **2.8953 and 3.3046.**

1. Answer the questions in the HW 17 Question 3 file, now posted on our class RStudio front page. Submit your knitted file with this assignment. You may need to consult the slide posted with this homework listing our R commands for computing confidence intervals.