6.2 Notes – Confidence Intervals for the Mean

(Small Samples)

I. <u>The t – Distribution</u>

In many real-life situations, the ________________________________ is unknown. If the random variable is normally distributed (or approximately normal) the sampling distribution for $\bar{x}$ is a ________________________.

Formula for t – distribution Critical values of t are denoted by ______.

<u>Properties of the t-distribution:</u>

1.
2. **degrees of freedom (df) –**
3.
4.
5.

<u>Example 1 – use the table:</u>

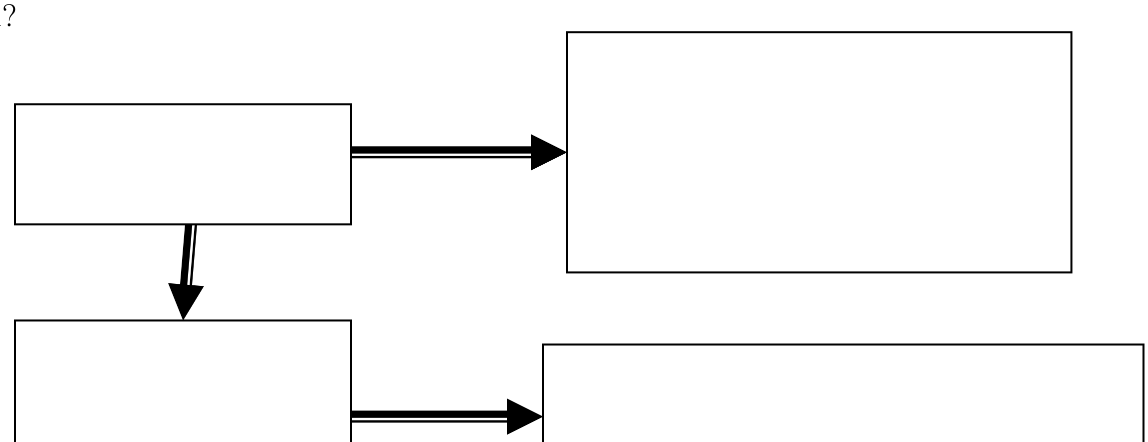
a. Find the critical value t_c, for a 90% confidence when the sample size is 22.
b. Find the critical value, t_c, for a 95% confidence when the sample size is 15.
c. Find the critical value, t_c, for an 99% confidence when the sample size is 28.

II. Confidence Intervals and t-Distributions

<u>Example 2:</u>

You randomly select 16 restaurants and measure the temperature of the coffee sold at each. The sample mean temperature is 162°F with a sample standard deviation of 10°F. Find the 90% confidence interval for the mean temperature.

How do you know when to use a normal distribution or a t – distribution to construct a confidence interval?



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<u>Example 3:</u>
You randomly select 18 adult male athletes and measure the resting heart rate of each. The sample mean heart rate is 64 beats per minutes with a sample standard deviation of 2.5 beats per minute. Assuming heart rates are normally distributed, should you use the normal distribution or the *t*-distribution, or neither to construct a 90% confidence interval for the mean heart rate? Find the interval, if possible.

Assignment:	new: pgs 330 – 331/1, 2, 13, 15, 17, 20, 21 old: pgs 271 – 273/ 1, 2, 11, 13