

## 9.2 IRA Guide

### *Introduction*

Screen 1: Degrees of freedom is just another way to say 1 less than the sample size.  $df = n - 1$

Screen 2: To make a normal probability plot in StatCrunch use Graph > QQ Plot. If the correlation statistic is greater than the critical value we can conclude that the sample comes from a population that is normally distributed. [Section 7.3]

Screen 3: I have removed this problem, so you should see a blank screen.

Screen 4: List of Objectives

### ***Objective 1 – Obtain a Point Estimate for the Population Mean ( $\mu$ )***

Screen 1: The sample mean ( $\bar{x}$ ) is the point estimate for the population mean ( $\mu$ ).

Screen 2: Example 1 shows how to find the point estimate for  $\mu$ . Be sure to watch the StatCrunch video solution.

Screen 3: This exercise is based on Example 1 on the previous screen. Use StatCrunch.

### ***Objective 2 – State Properties of Student's t-distribution***

Screen 1: Skim through this explanation about why we typically do not know the population standard deviation.

Screen 2: You can watch this video if you have 11+ minutes to kill, but this material is not necessary.

Screen 3: Definition of Student's t-distribution.

Screen 4: This screen summarizes the properties of the t-distribution.

Screen 5: In this exercise, the smaller sample size has the most area in the tails ... then the larger sample size ... then the z-distribution.

**You only get one attempt at this question so be sure to select the answer as I have mentioned – smaller sample size 1<sup>st</sup>, larger sample size 2<sup>nd</sup>, standard normal distribution 3<sup>rd</sup>**

### ***Objective 3 – Determine t-values***

Screen 1: You can breeze through this explanation, as we can use StatCrunch to find t-values.

Screen 2: Example 2 shows how to find t-values. Watch the StatCrunch video to learn how to use StatCrunch to find t-values. (That way you won't need to use the table.)

Screen 3: This exercise is based on Example 2 on the previous screen.

In part c, you are given area to the left. You proceed as if you had area to the right, then change t to a negative value.

In part d, subtract the level of confidence from 1 and then divide by 2 to find out the area in each tail. Find the t-value for the right tail.

Screen 4: You can skip this since we won't use the table anyway.

**Objective 4 – Construct and Interpret a Confidence Interval for a Population Mean ( $\mu$ )**

Screen 1: Breeze through the definition of a confidence interval for  $\mu$ .

Screen 2: Breeze through this background material as well.

Screen 3: Example 3 shows how to create a confidence interval for  $\mu$ . BE SURE TO WATCH THE STATCRUNCH VIDEO SOLUTION.

Screen 4: Skip over this.

Screen 5: This exercise is based on Example 3 on Screen 3. Use StatCrunch for part b. For part c, remember that sample size affects the margin of error.

Screen 6: Another confidence interval problem – this one uses “summary”, not “data”.

Screen 7: Skip over this screen.

Screen 8: Since this is based on the activity I just told you to skip ...

Part a: the proportion of intervals will be below 0.95

Part b: The proportion will approach 0.95 as  $n$  increases.

**You only get one attempt at this problem, so type the answers for parts a and b as I have stated above.**

Screen 9: Skip

**Objective 5 – Determine the Sample Size Necessary for Estimating a Population Mean within a Given Margin of Error**

Screen 1: Development of the formula, although we will use StatCrunch.

Screen 2: Example 4 shows how to find the sample size. Watch the StatCrunch video solution!

**NOTE: The menus in StatCrunch have changed slightly since the videos were recorded.**

**Menu Selection: Stats > Z-statistics > One sample > Width/Sample size**

Screen 3: This exercise is based on Example 4 on the previous screen. Be sure to use StatCrunch.

Screen 4: End of Section