Step 6: The sample statistics of $n = 11$ and $\bar{x} = 0.938$ W/kg and the value of $s = 0.423$ W/kg are used to calculate the test statistic as follows:

$$t = \frac{\bar{x} - \mu_{\bar{x}}}{\frac{s}{\sqrt{n}}} = \frac{0.938 - 1.00}{\frac{0.423}{\sqrt{11}}} = -0.486$$

Using this test statistic of $t = -0.486$, we now proceed to find the critical value from Table A-3. With df $= n - 1 = 10$, refer to Table A-3 and use the column corresponding to an area of 0.05 in one tail to find that the critical value is $t = -1.812$, which is shown in Figure 8-8.

Step 7: Because the test statistic of $t = -0.486$ does not fall in the critical region bounded by the critical value of $t = -1.812$ as shown in Figure 8-8, fail to reject the null hypothesis.

Interpretation

Because we fail to reject the null hypothesis, we conclude that there is not sufficient evidence to support the claim that cell phones have a mean radiation level that is less than 1.00 W/kg.

The validity of this conclusion depends on a sound sampling method. We can see from the given list of cell phone models that one phone was measured for each of 11 different models, so it is possible that we do not have a simple random sample of cell phones selected from the population of cell phones in use. It would be wise to further investigate whether this affects our results.

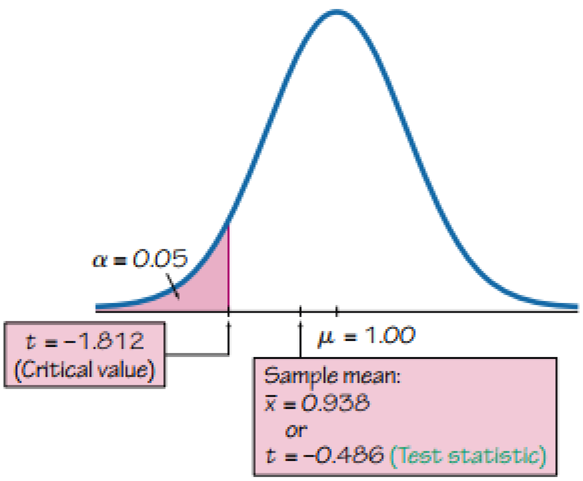

Figure 8-8 ***t*-Test: Critical Value Method**

Finding *P*-Values with the Student *t* Distribution

Example 1 used the critical value approach to hypothesis testing, but STATDISK, Minitab, XLSTAT, StatCrunch, the TI-83/84 Plus calculator, and many articles in professional journals will display *P*-values. For the preceding example, STATDISK, Minitab, XLSTAT, StatCrunch, and the TI-83/84 Plus calculator display a *P*-value of 0.3191. (Minitab displays the rounded value of 0.319.) With a significance level of 0.05 and a *P*-value greater than 0.05, we fail to reject the null hypothesis, as we did using the critical value method in Example 1. If computer software or a TI-83/84