SAR Data for a sample of 20 cell phones	
1.48	1.53
0.8	0.68
1.15	1.4
1.36	1.24
0.77	0.57
0.462	0.2
1.36	0.51
1.39	0.3
1.3	0.73
0.7	0.869

Table 8.2

Notice the difference in the confidence intervals calculated in Example 8.3 and the following Try It exercise. These intervals are different for several reasons: they were calculated from different samples, the samples were different sizes, and the intervals were calculated for different levels of confidence. Even though the intervals are different, they do not yield conflicting information. The effects of these kinds of changes are the subject of the next section in this chapter.

Changing the Confidence Level or Sample Size

EXAMPLE 8.4

Problem

Suppose we change the original problem in Example 8.2 by using a 95% confidence level. Find a 95% confidence interval for the true (population) mean statistics exam score.

Solution

To find the confidence interval, you need the sample mean, $\overline{x}$, and the *EBM*.

$\overline{x} = 68$

$EBM = \left(z_{\frac{\alpha}{2}}\right)\left(\frac{\sigma}{\sqrt{n}}\right)$

$\sigma = 3$; $n = 36$; The confidence level is 95% ($CL = 0.95$).

$CL = 0.95$ so $\alpha = 1 - CL = 1 - 0.95 = 0.05$

$\frac{\alpha}{2} = 0.025 \qquad z_{\frac{\alpha}{2}} = z_{0.025}$

The area to the right of $z_{0.025}$ is 0.025 and the area to the left of $z_{0.025}$ is 1 – 0.025 = 0.975.

$z_{\frac{\alpha}{2}} = z_{0.025} = 1.96$

when using invnorm(0.975,0,1) on the TI-83, 83+, or 84+ calculators. (This can also be found using appropriate commands on other calculators, using a computer, or using a probability table for the standard normal distribution.)