Next, find the *EBM*. Because you are creating a 98% confidence interval, *CL* = 0.98.

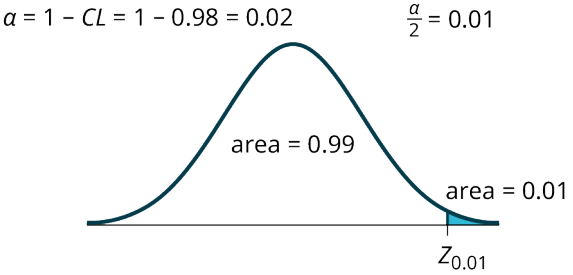

Figure 8.4

You need to find $z_{0.01}$ having the property that the area under the normal density curve to the right of $z_{0.01}$ is 0.01 and the area to the left is 0.99. Use your calculator, a computer, or a probability table for the standard normal distribution to find $z_{0.01} = 2.326$.

$$EBM = (z_{0.01})\frac{\sigma}{\sqrt{n}} = (2.326)\frac{0.337}{\sqrt{30}} = 0.1431$$

To find the 98% confidence interval, find $\overline{x} \pm EBM$.

$\overline{x}$ – *EBM* = 1.024 – 0.1431 = 0.8809

$\overline{x}$ – *EBM* = 1.024 – 0.1431 = 1.1671

We estimate with 98% confidence that the true SAR mean for the population of cell phones in the United States is between 0.8809 and 1.1671 watts per kilogram.

Solution

USING THE TI-83, 83+, 84, 84+ CALCULATOR

Press STAT and arrow over to TESTS.
Arrow down to `7:ZInterval`.
Press ENTER.
Arrow to Stats and press ENTER.
Arrow down and enter the following values:
σ: 0.337
$\overline{x}$: 1.024
n: 30
C-level: 0.98

Arrow down to Calculate and press ENTER.
The confidence interval is (to three decimal places) (0.881, 1.167).

TRY IT 8.3

Table 8.2 shows a different random sampling of 20 cell phone models. Use this data to calculate a 93% confidence interval for the true mean SAR for cell phones certified for use in the United States. As previously, assume that the population standard deviation is $\sigma = 0.337$.