

Interpretation

The probability of randomly selecting a passenger with a waiting time greater than 2 minutes is 0.6.

Standard Normal Distribution

The density curve of a uniform distribution is a horizontal straight line, so we can find the area of any rectangular region by applying this formula: $\text{Area} = \text{height} \times \text{width}$. Because the density curve of a normal distribution has a complicated bell shape as shown in Figure 6-1, it is more difficult to find areas. However, the basic principle is the same: *There is a correspondence between area and probability.* In Figure 6-4 we show that for a standard normal distribution, the area under the density curve is equal to 1.

DEFINITION The **standard normal distribution** is a normal distribution with the parameters of $\mu = 0$ and $\sigma = 1$. The total area under its density curve is equal to 1 (as in Figure 6-4).

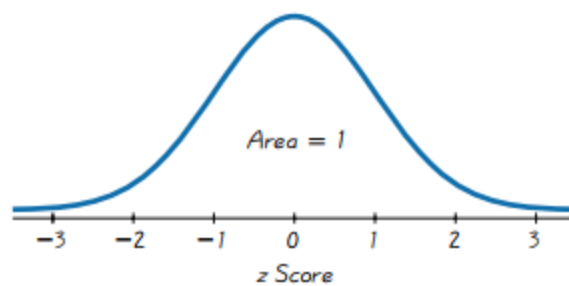


Figure 6-4 Standard Normal Distribution

It is not easy to manually find areas in Figure 6-4, but we have two other relatively easy ways of finding those areas: (1) Use technology; (2) use Table A-2 in Appendix A (the Standard Normal Distribution table in the Appendix).

Finding Probabilities when Given z Scores

We can find areas (or probabilities) for many different regions in Figure 6-4 by using a TI-83/84 Plus calculator or computer software such as STATDISK, Minitab, Excel, or StatCrunch, or we can also use Table A-2 (in Appendix A and the *Formulas and Tables* insert card). Key features of the different methods are summarized in Table 6-1 that follows. Because calculators or computer software generally give more accurate results than Table A-2, we strongly recommend using technology. (When there are discrepancies, answers in Appendix D will generally include results based on Table A-2 as well as answers based on technology.)

If using Table A-2, it is essential to understand these points:

1. Table A-2 is designed only for the *standard* normal distribution, which has a mean of 0 and a standard deviation of 1.