

UNIT ACTIVITY:

USING AREA TO ESTIMATE STANDARD NORMAL PROPORTIONS

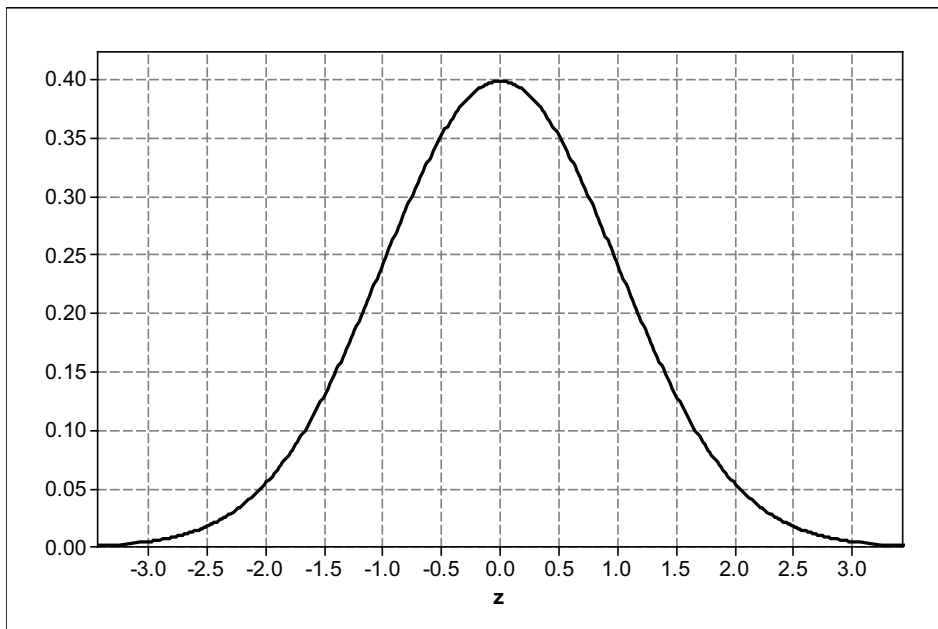
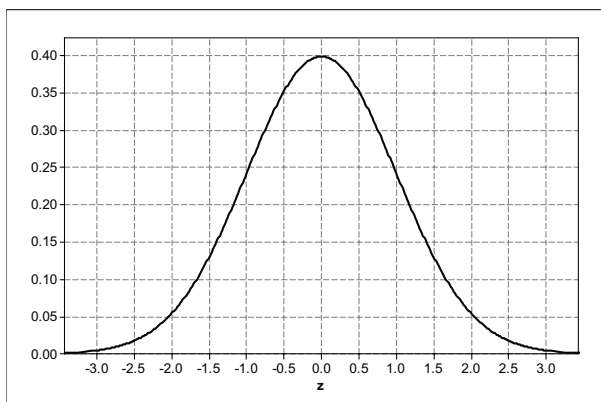


Figure 8.11. The standard normal density curve.

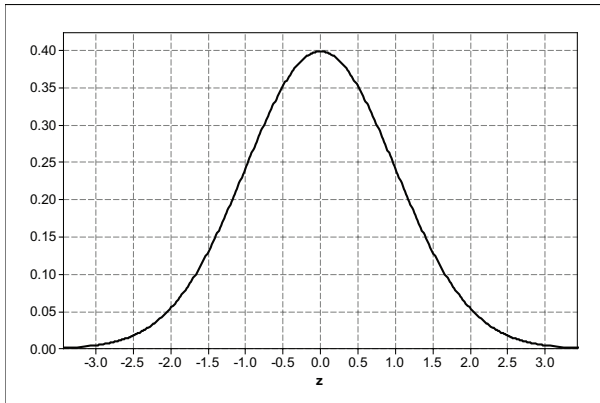
1. Estimate the number of rectangles that fit under the standard normal density curve in Figure 8.11. The area under any density curve is 1, which represents a proportion of all the data or 100% of the data.
2. Using the rectangles, you will estimate the proportion of data from a standard normal distribution that falls below 0. (You should already know the answer. So, this question will help you check the process.)
 - a. Shade the area under the curve that lies to the left of $z = 0$ on the normal curve below. Count the number of rectangles contained in the shaded region.



b. To find the proportion of data that falls below $z = 0$, divide the number of rectangles you got in (a) by the total number of rectangles counted for question 1. What is your estimate for this proportion?

3. Next, using the rectangles, you will estimate the proportion of data that falls below $z = -1$.

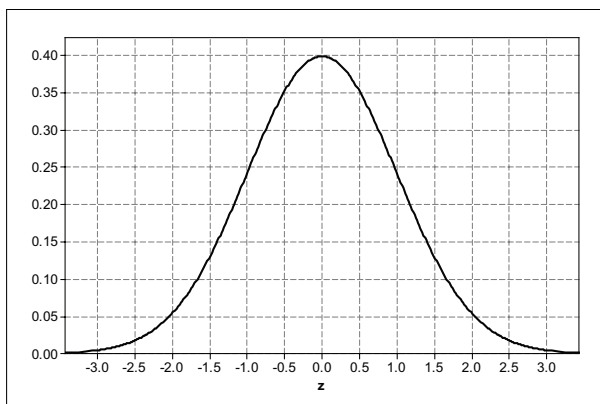
a. Shade the area under the curve that lies to the left of $z = -1$ on the normal curve below. Count the number of rectangles contained in the shaded region.



b. To find the proportion of data that falls below $z = -1$, divide the number of rectangles you got in (a) by the total number of rectangles from question 1. What is your estimate for this proportion?

4. Repeat question 3 using $z = -2$. Show your calculations.

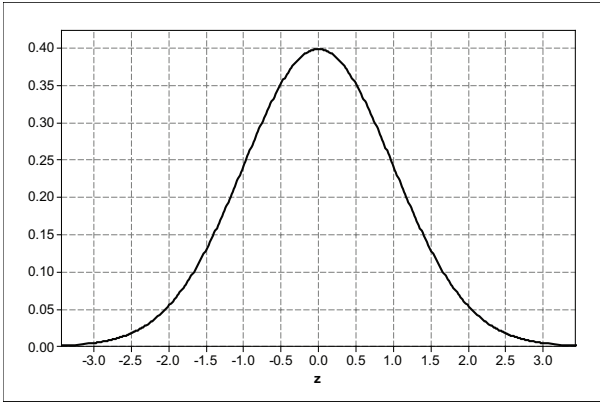
a.



b. Proportion = _____

5. Repeat question 3 using $z = 1$.

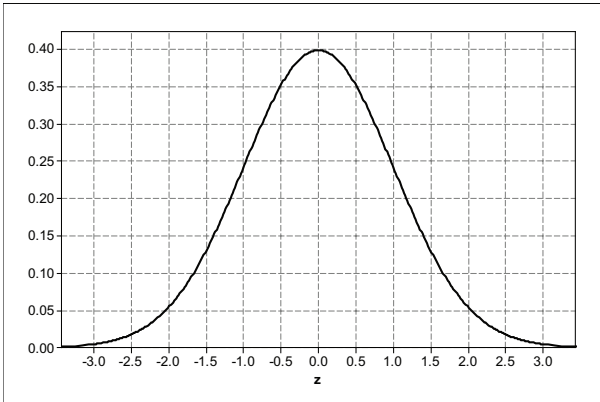
a.



b. Proportion = _____

6. Repeat question 3 with $z = 2$.

a.



b. Proportion = _____

7. Now it is time to compare your estimates with the proportions given in the standard normal table (z-table). Given any value of z , the standard normal table will tell you the proportion of data that falls at or below the given value.

a. Use a standard normal table to complete the entries in column two of Table 8.1.

b. Enter your estimates from questions 2 – 6 into column three of Table 8.1.

z	Proportion from z-table	Estimated Proportion
-2.00		
-1.00		
0.00		
1.00		
2.00		

Table 8.1. Comparisons of proportions from a z-table and estimates.

c. How close were your estimates of the area under the standard normal curve to the actual proportions from the z-table?