USING THE Z-TABLE

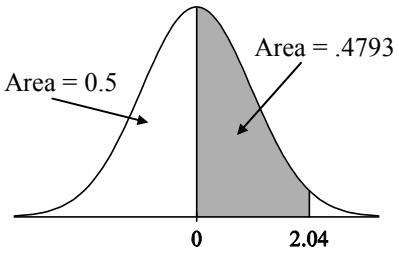
Learning to use the table of the standard normal distribution is extremely important! Make sure you can do problems like these without difficulty. Note that the total area under the normal curve is 1.000, with 0.500 in each half. At the middle line, z = 0; to the right z is positive; to the left z is negative.

Probability (or proportion or percentage) = area under the curve. Start with your z-value, along the borders of the table, and look for area on the inside of the table.

To find a z-value for a given probability or percentage (area): Find the area on the inside of the table, and then read the z-value along the borders of the table.

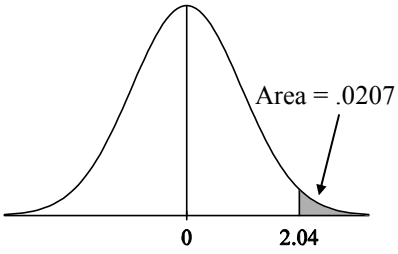
Your text uses two tables. One is a left-hand tail area and the other is a cumulative table extending from left to right. Because the distribution is symmetric, you can use the left-hand tail table to find an area in the right-hand tail – the z scores will be negative, but the area is the same – area is always positive!

Find P ($0 \leq z \leq 2.04$)



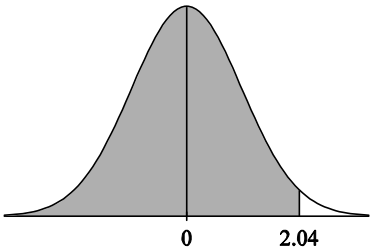
Look up *cumulative* area in the table and subtract 0.5000 from it.
Probability = .9793 – .5000 = .4793

Find P ($z \geq 2.04$)



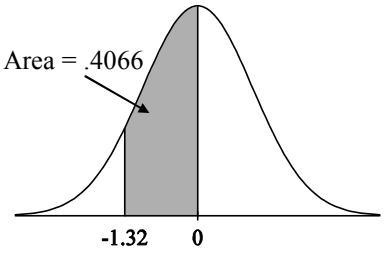
Look up the *cumulative* area in the table and subtract it from 1.0000. This is the area to the right of 2.04.
Probability = 1.000 – .9793 = .0207

Find P ($z \leq 2.04$)



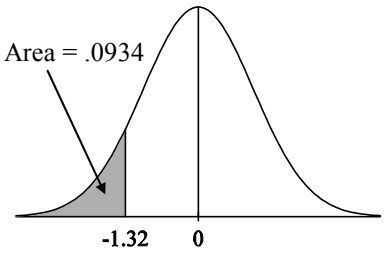
Read the area directly from the *cumulative* table.
Probability = .9793

Find P (-1.32 ≤ z ≤ 0)



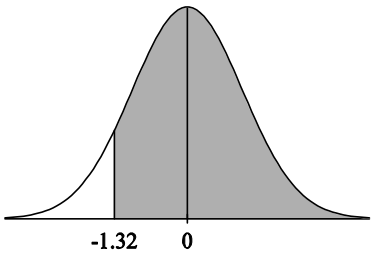
The total area to the left of 0 is 0.5. Look up the *tail area* to the left of -1.32 and subtract it from 0.5000.
Probability = 0.5 – .0934 = .4066

Find P (z < -1.32)



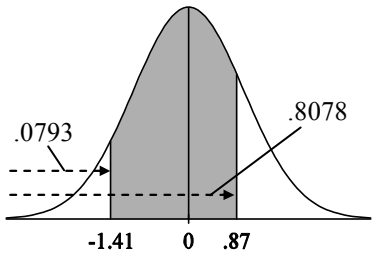
Read this *tail area* directly from the table.
Probability = .0934

Find P (z ≥ -1.32)



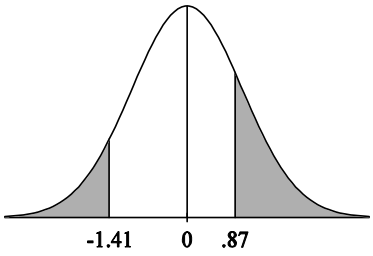
Even though the z score is negative, use the *cumulative* table with a positive z. Because of symmetry, you'll get the same area.
(Or, subtract the *tail area* from 1.00)
Probability = .9066

Find P (-1.41 ≤ z ≤ .87)



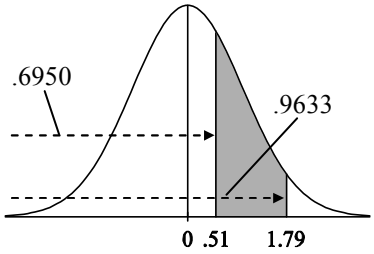
Look up the *cumulative* area for z =.87. Then subtract the *tail* area for z = -1.41.
Probability = .8078 – .0793 = .7285

Find
P (z ≤ -1.41 *or* z ≥ .87)



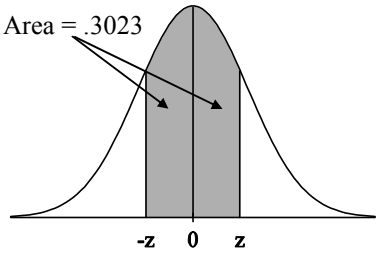
We already calculated the area between -1.41 and .87 to be .7285. Since the area under the entire curve equals 1, just subtract .7285 from 1 to find the combined area in the tails: 1 – .7285 = .2715. (Or, find the *two tail areas* and add them: .0793 + .1922)
Probability = .2715

Find P (.51 ≤ z ≤ 1.79)



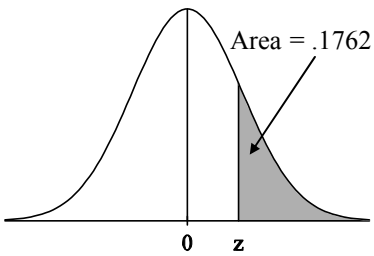
Find the *cumulative* area for z = 1.79. Then find the *cumulative* area for z = .51 and subtract the smaller area from the larger area to get the area between .51 and 1.79.
Probability = .9633 – .6950 = .2683

The area between z and -z is .6046.
Find z.



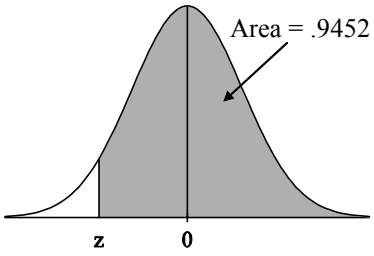
z and -z are the same distance from zero (to the right and left). The area between them is .6046. Since they are the same distance from 0, half of the .6046 area is between each z and 0. Add .5000 to .3023 and look up the area of .8023 in the *cumulative* table – the corresponding z is .85.
z = .85

The area to the right of z is .1762.
Find z.



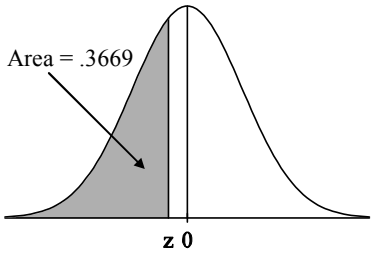
1.0000 – .1762 = .8238, the *cumulative* area to the left of z. Look up this area – the corresponding z is .9300.
Or, look up the area of .1762 in the *tail-area* table and change the z score to positive.
z = .93

The area to the right of z is .9452.
Find z.



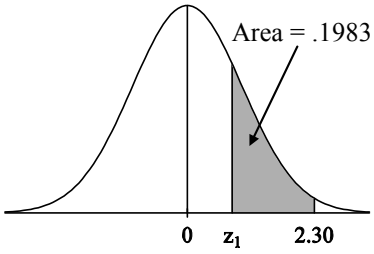
Since the area to the right of z is more than .5, z must lie to the left of 0. Look up .9452 in the *cumulative* table and change the z score to a negative. (Or, subtract .9452 from 1.000 and look up this *tail area.*)
The corresponding z is -1.60.
z = -1.60

The area to the left of z is .3669.
Find z.



The area to the left of z is less than .5, so z must be to the left of 0. Look up this area in the *tail-area* table – the corresponding z is -.34.
z = -.34

The area between z_1 and z_0 = 2.30 is .1983.
Find z_1.



Look up the *cumulative* area for a z_0 of 2.30 (= .9893). The area to the right of 2.3 is only .0107, so z_1 must be to the left of 2.3 – between 0 and 2.3. Subtract .1983 from .9893 = .7910. Look up this area in the *cumulative* table – the corresponding z_1 value is .81.
z_1 = .81