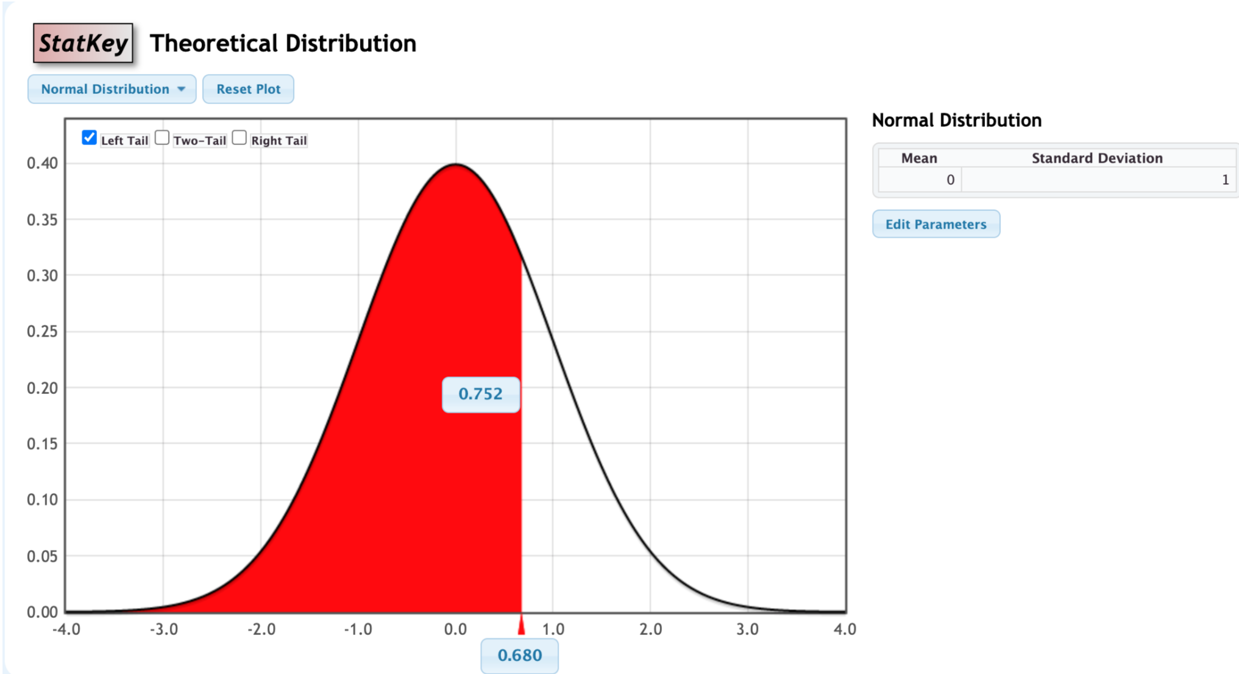
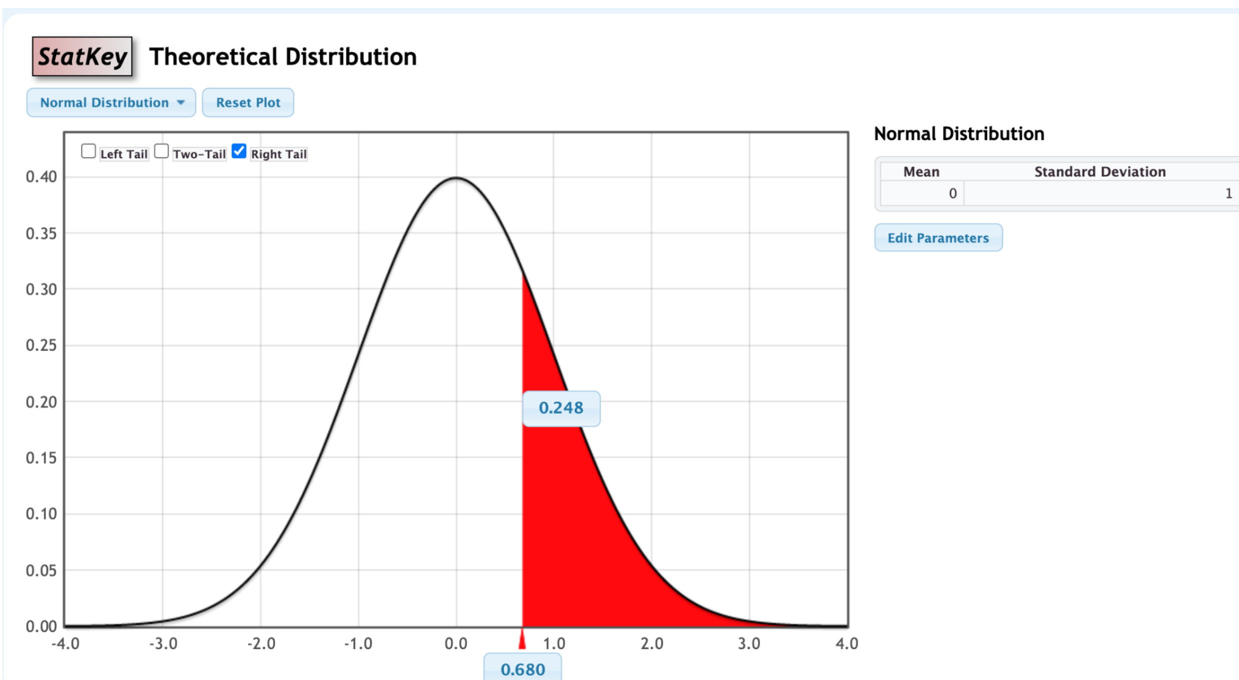
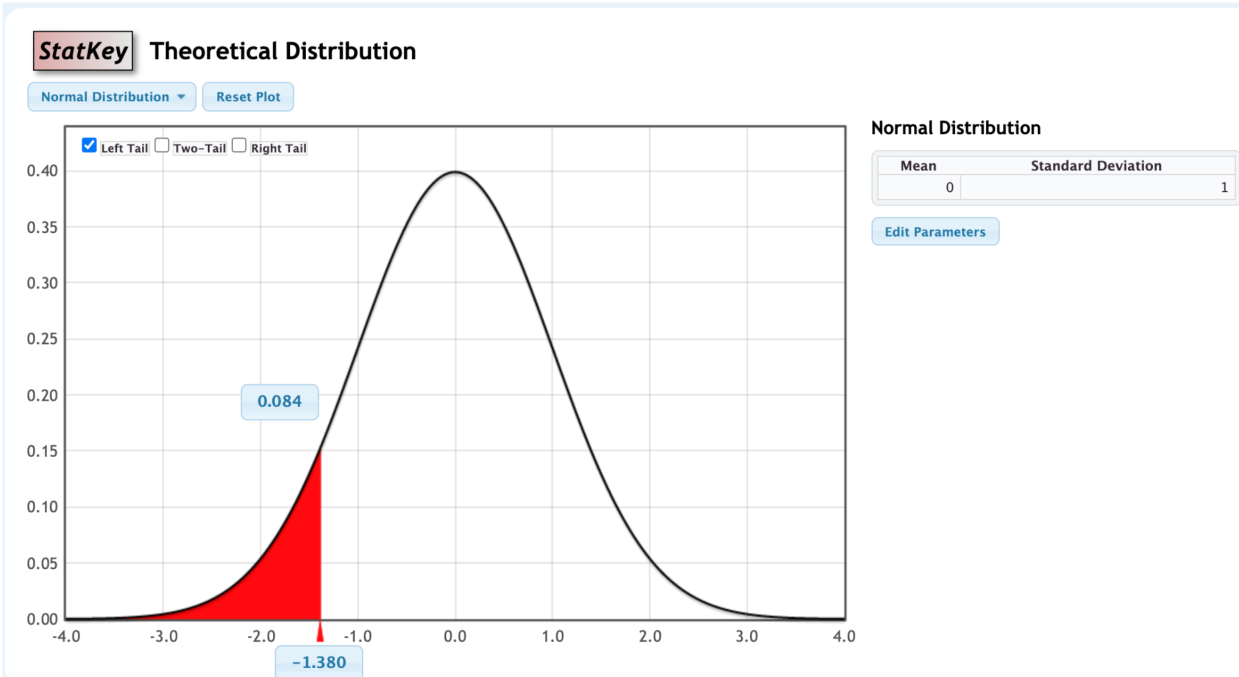
1. The value is the red shaded area, 0.752.



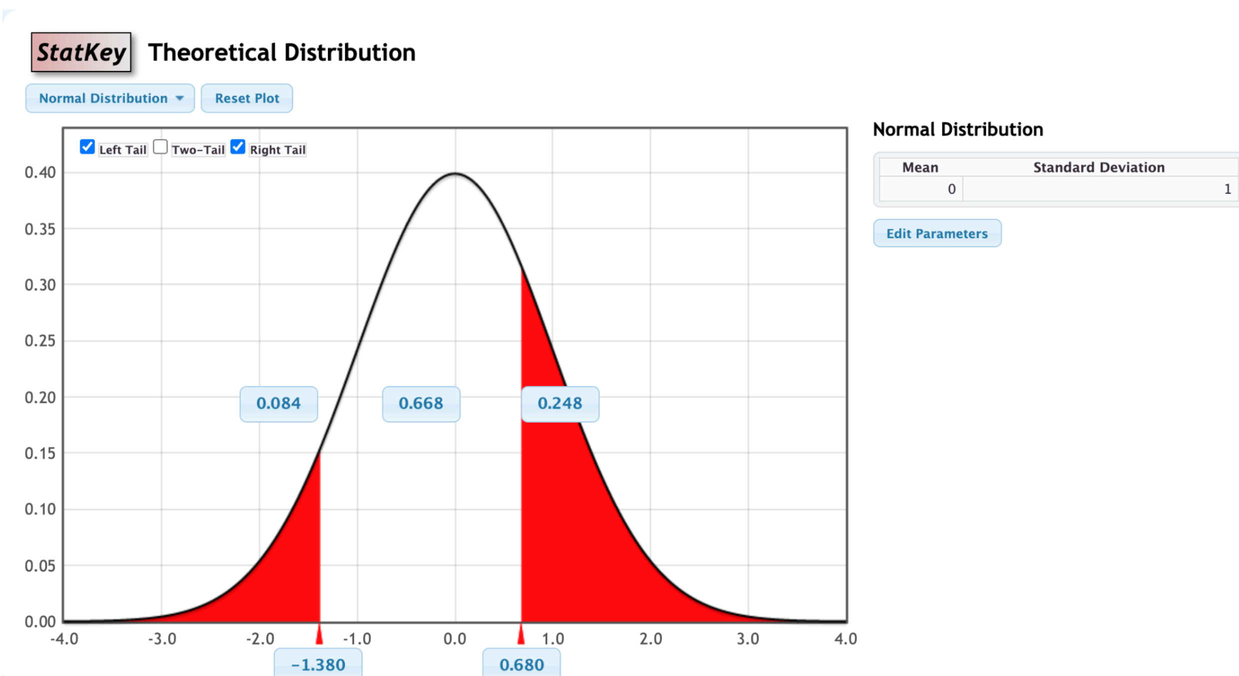
2. The answer is the value of the area to the right of cutoff, 0.68, now shaded because I selected “right tail”. It is 0.248, which can also be found by taking one minus the answer to Problem 1.



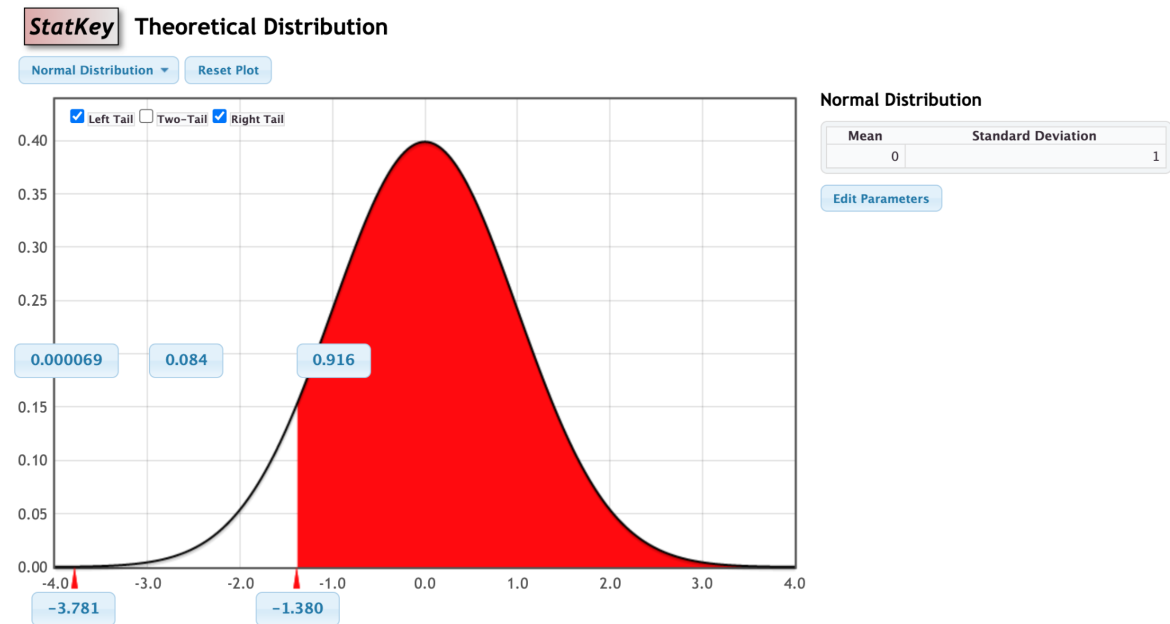
3. As seen here, the answer this time is 0.084.



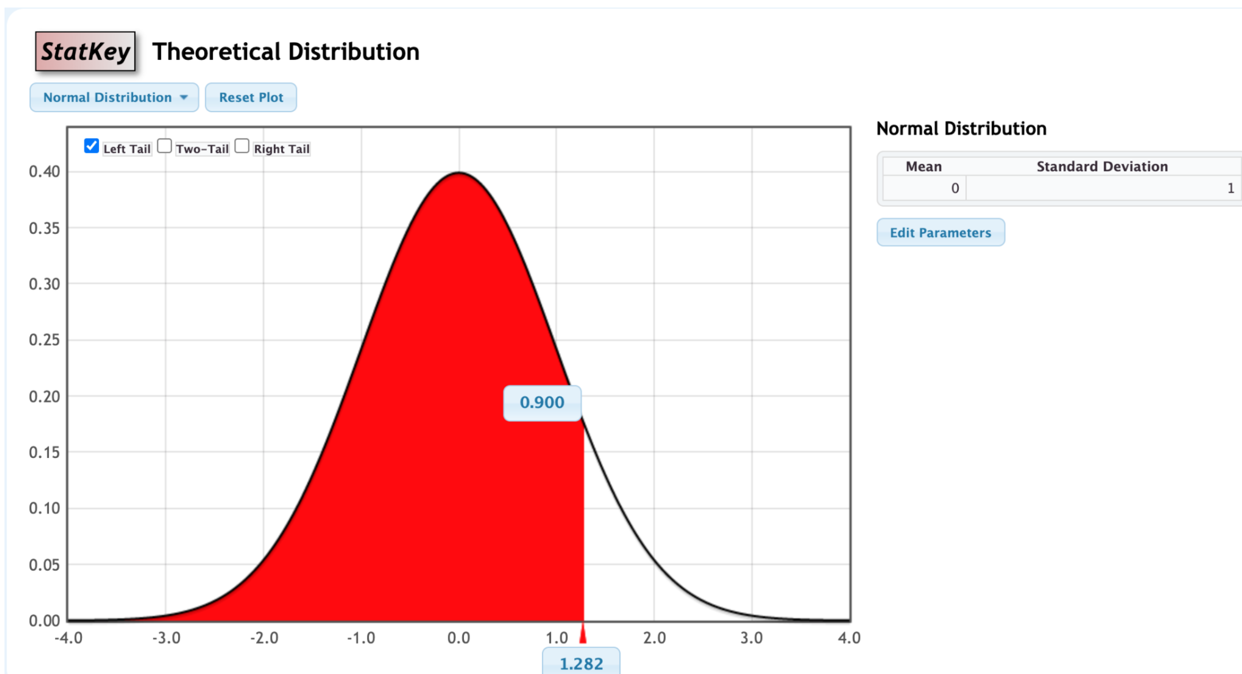
4. Avoid the “two-tail” option here, as you will not be allowed to adjust the two cutoffs separately. Instead, turn on both left- and right-tail, but also realize that what is desired is the unshaded area in between the two cutoffs, amounting to 0.668. It was also possible to get the answer by taking subtracting the answer to Problem 3 from that of Problem 1.



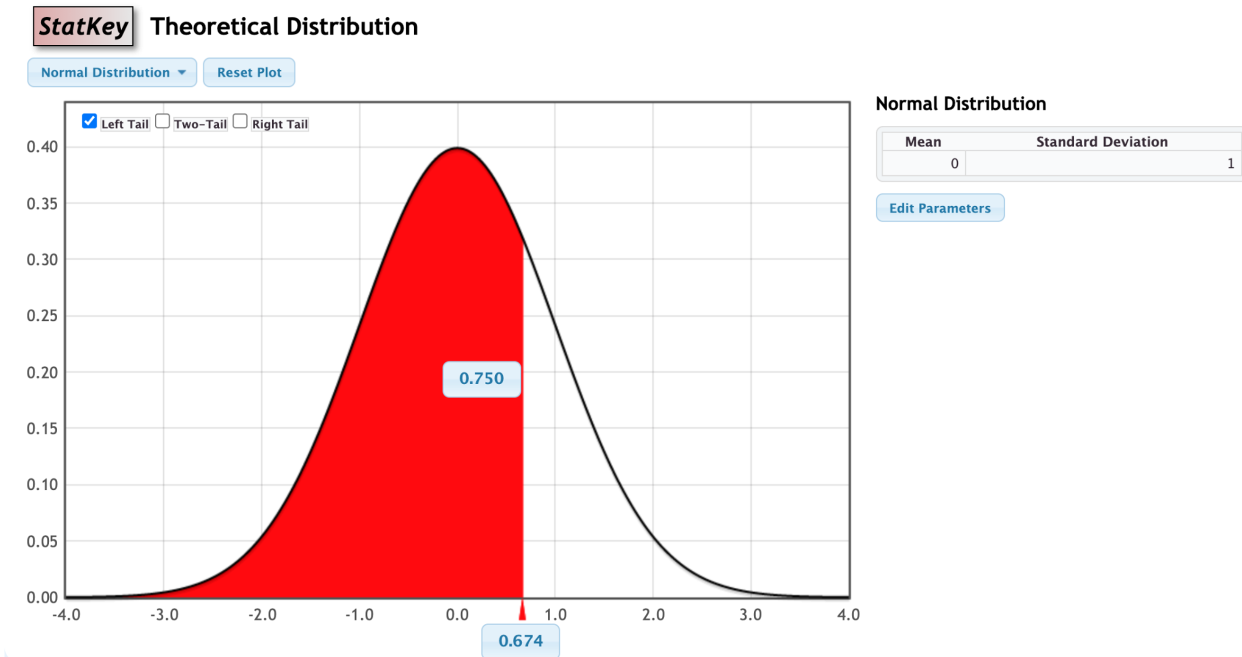
5. This one is much like Problem 4, with an answer 0.084. To three significant digits (which is all StatKey gives), this is the same as the answer to Problem 3. In actual fact, it is slightly different, because it does not include the left-tail area out past Z= -3.81, which only amounts to about 0.000069.



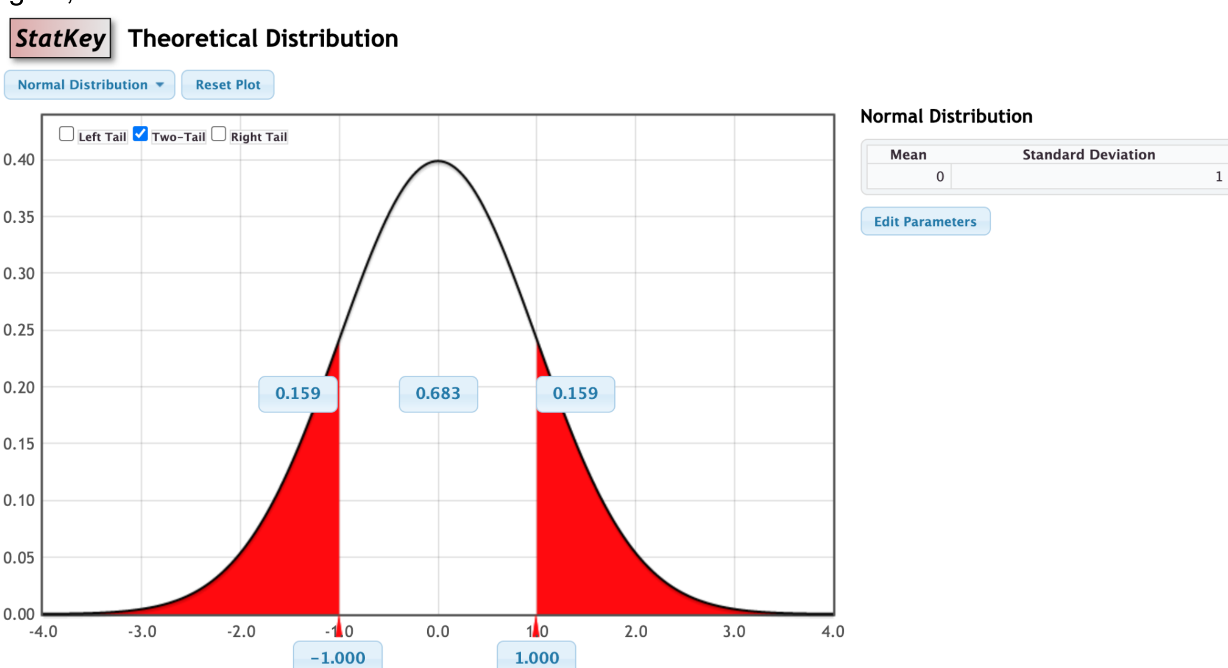
6. We are being asked for the 0.8997 quantile (roughly the 90th percentile, since StatKey does not allow you to input all 4 decimal places). We obtain this by manipulating the area and determining the cutoff. The cutoff value, as seen below, is k = 1.282.



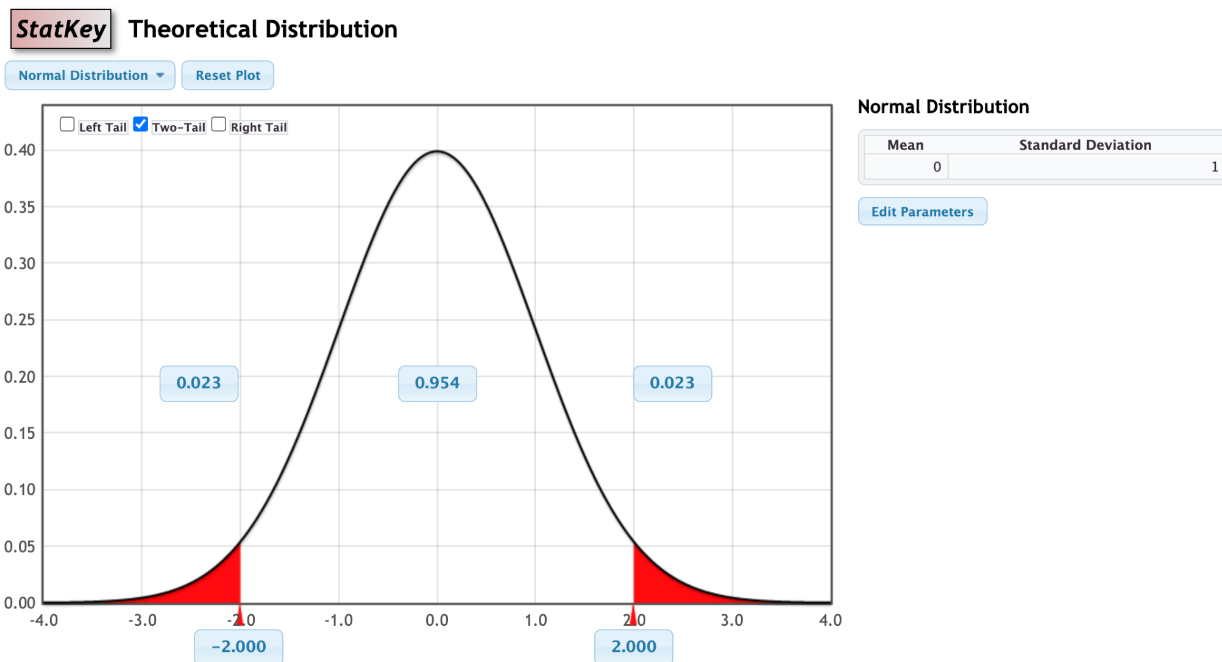
7. Finding Q3 is like Problem 6---you must set the area to 0.75, since Q3 is the same as the 75th percentile. The value of Q3 is 0674. By symmetry, the value of Q1 will be the negative of this, -0.0674.



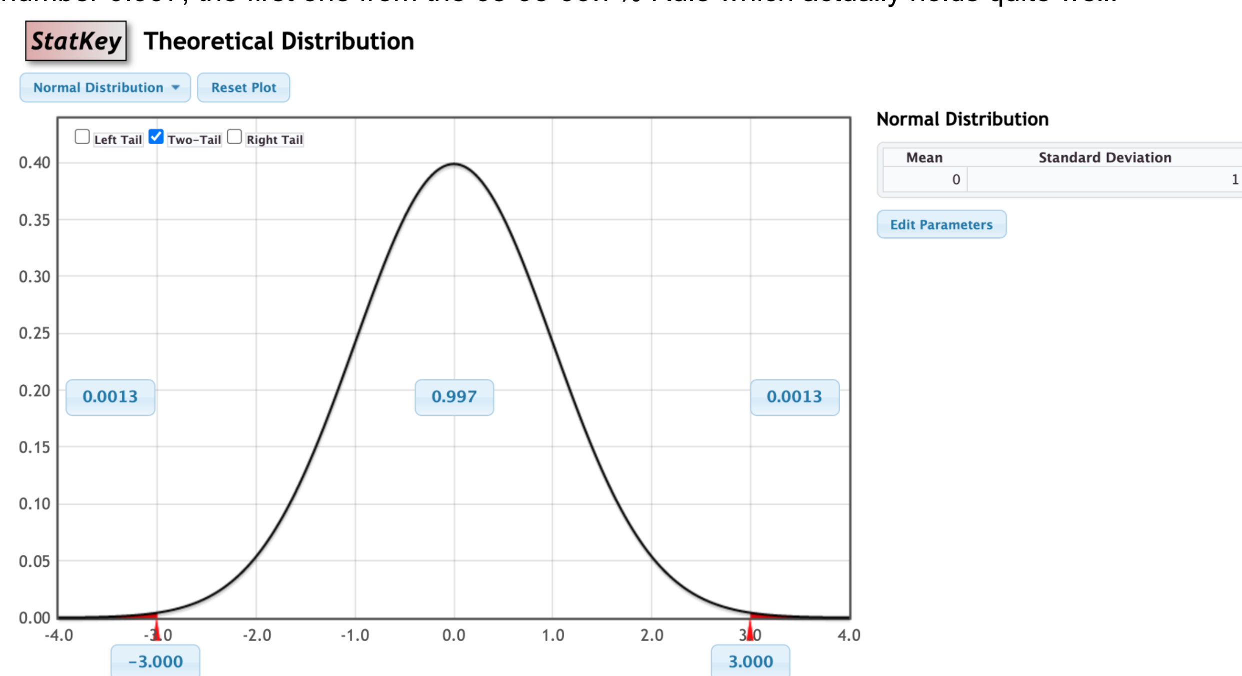
8. This is like Problems 4 and 5 except, since the cutoffs are symmetric about 0, you can use the two-tailed option. See that the answer is not exactly 68% after all; it's slightly higher, at 0.683.



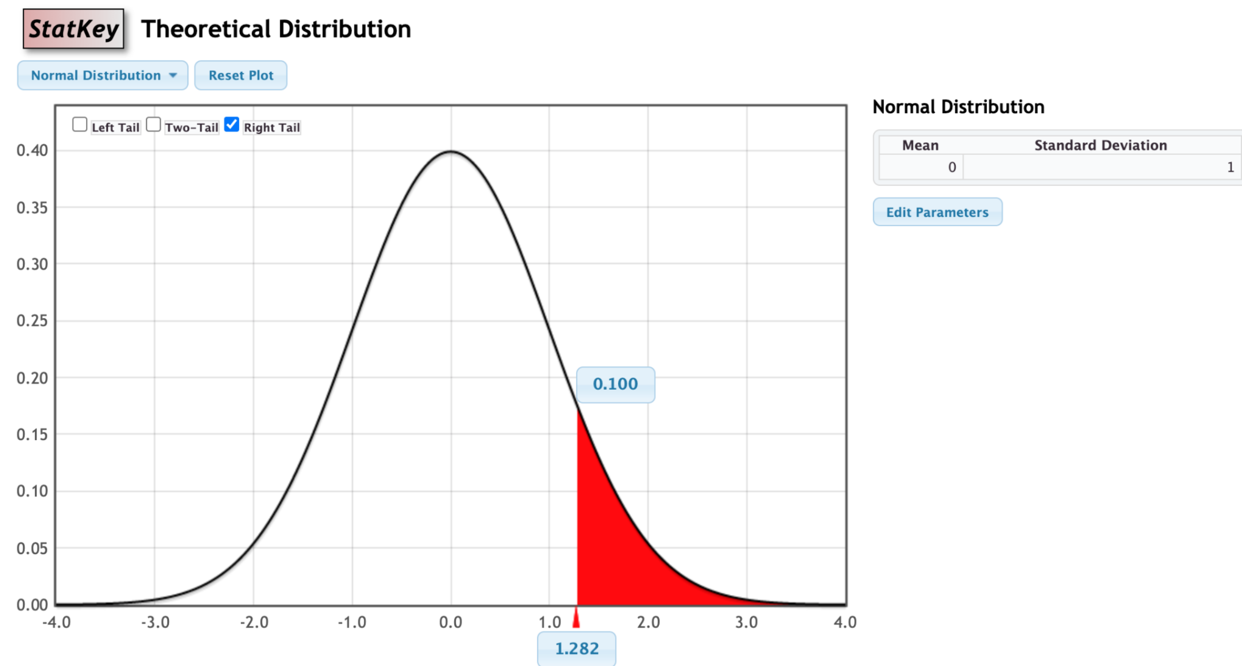
9. This is like Problem 8. See that the answer is not exactly 0.95 after al, but is slightly higher, at 0.954.



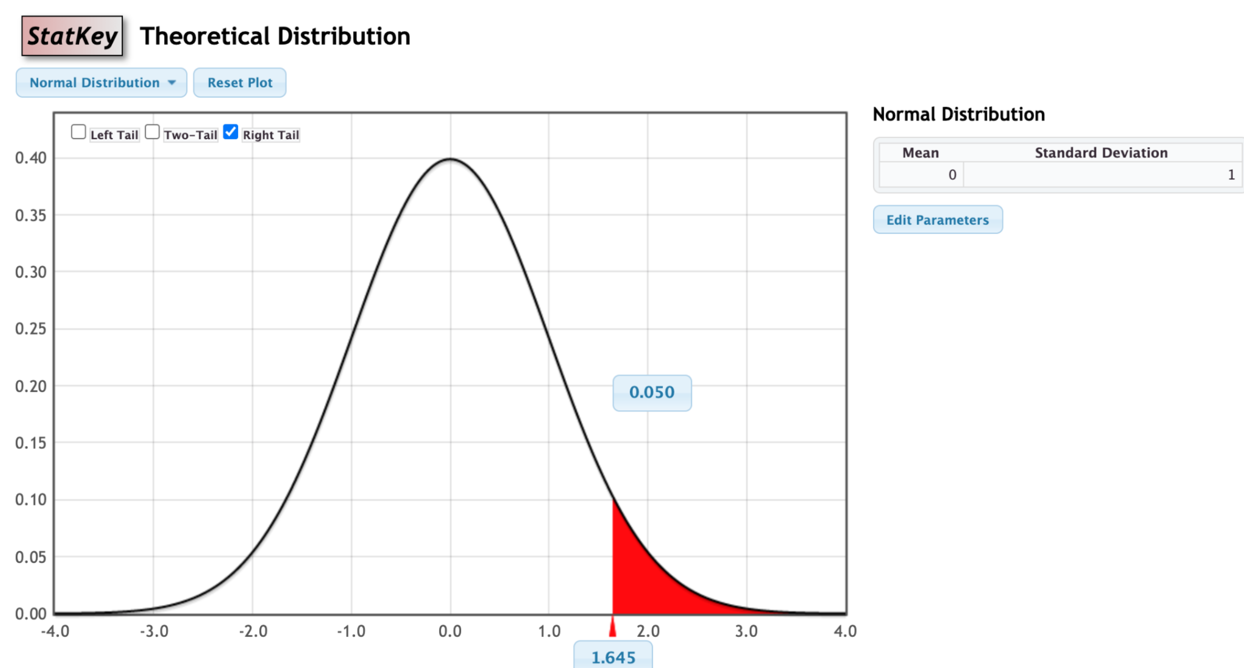
10. This is like Problem 8 and 9. The answer, accurate to 3 decimal places, is, indeed, the number 0.997, the first one from the 68-95-99.7% Rule which actually holds quite well.



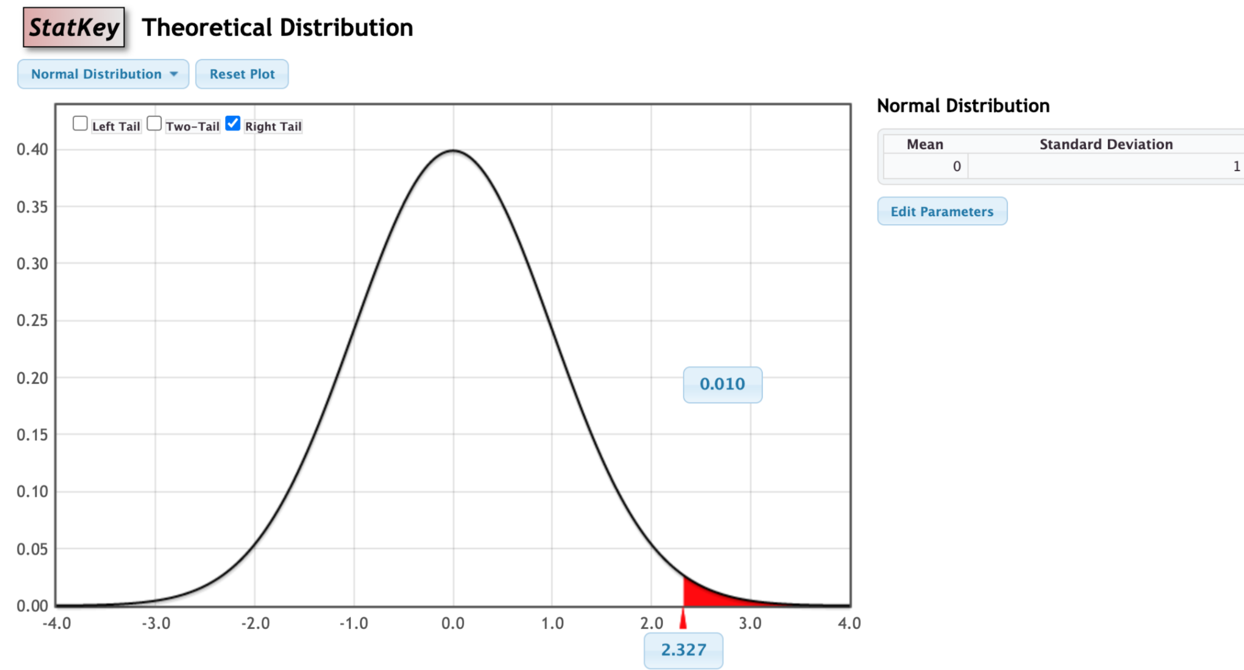
11. We seek the cutoff so that the area in the right tail is 0.1. That occurs when we make the cutoff z* = 1.282.



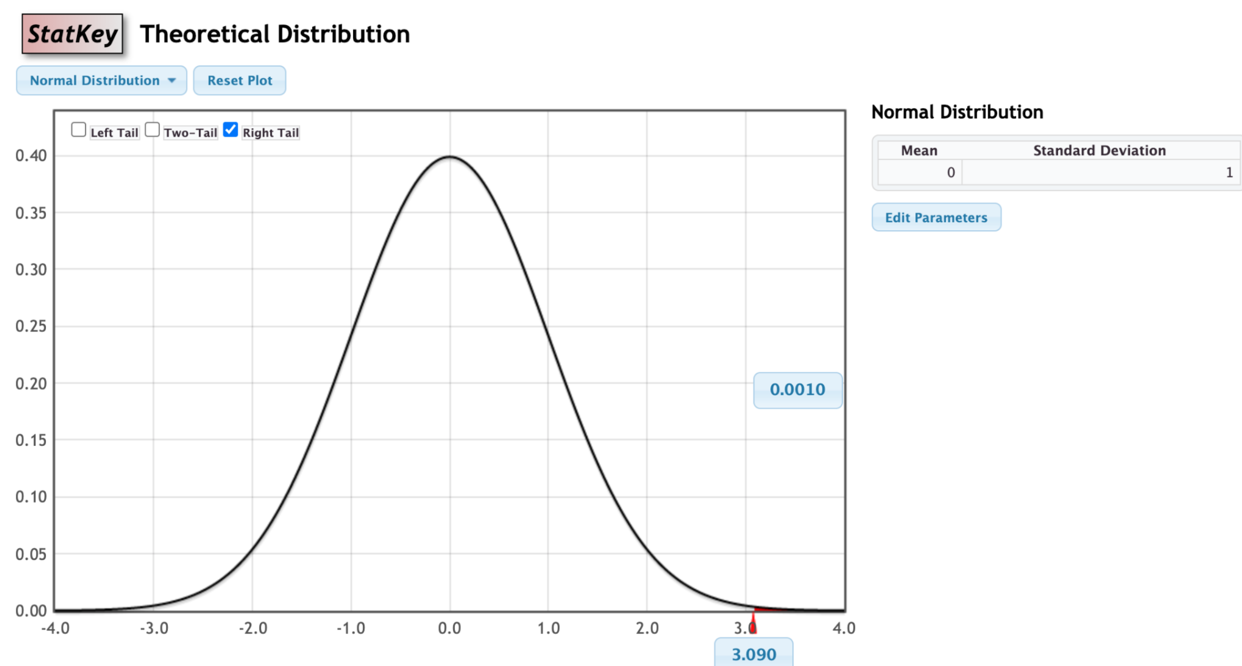
12. We seek the cutoff so that the area in the right tail is 0.05. That occurs when we make the cutoff z* = 1.645.



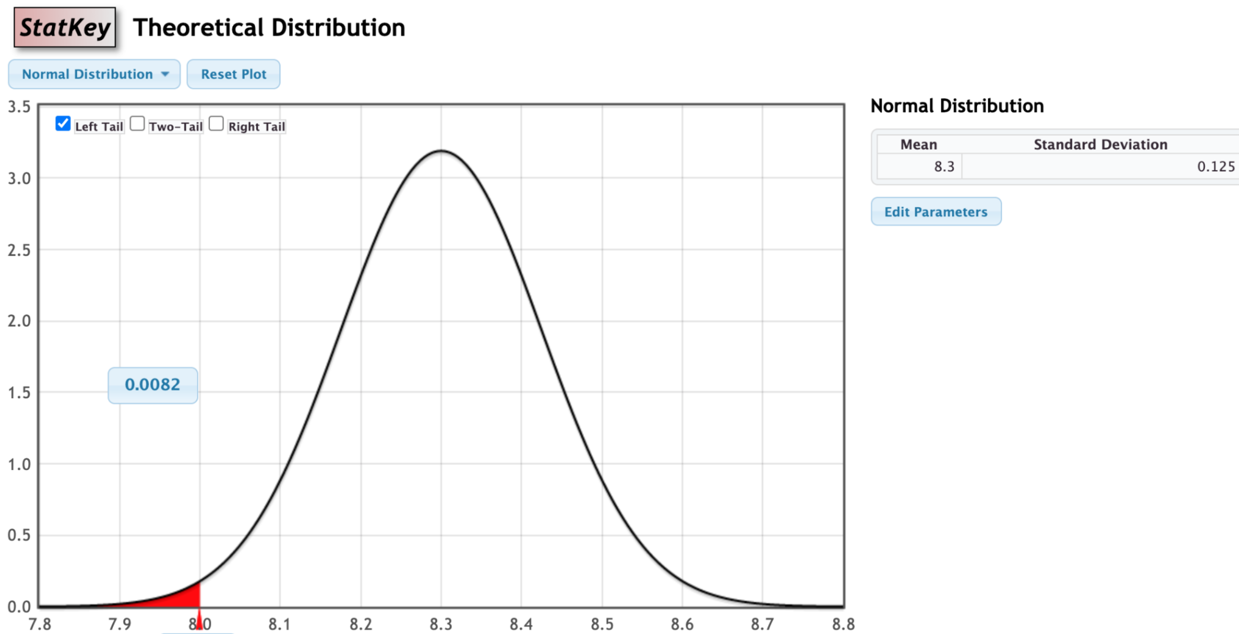
13. We seek the cutoff so that the area in the right tail is 0.01. That occurs when we make the cutoff z* = 2.327.



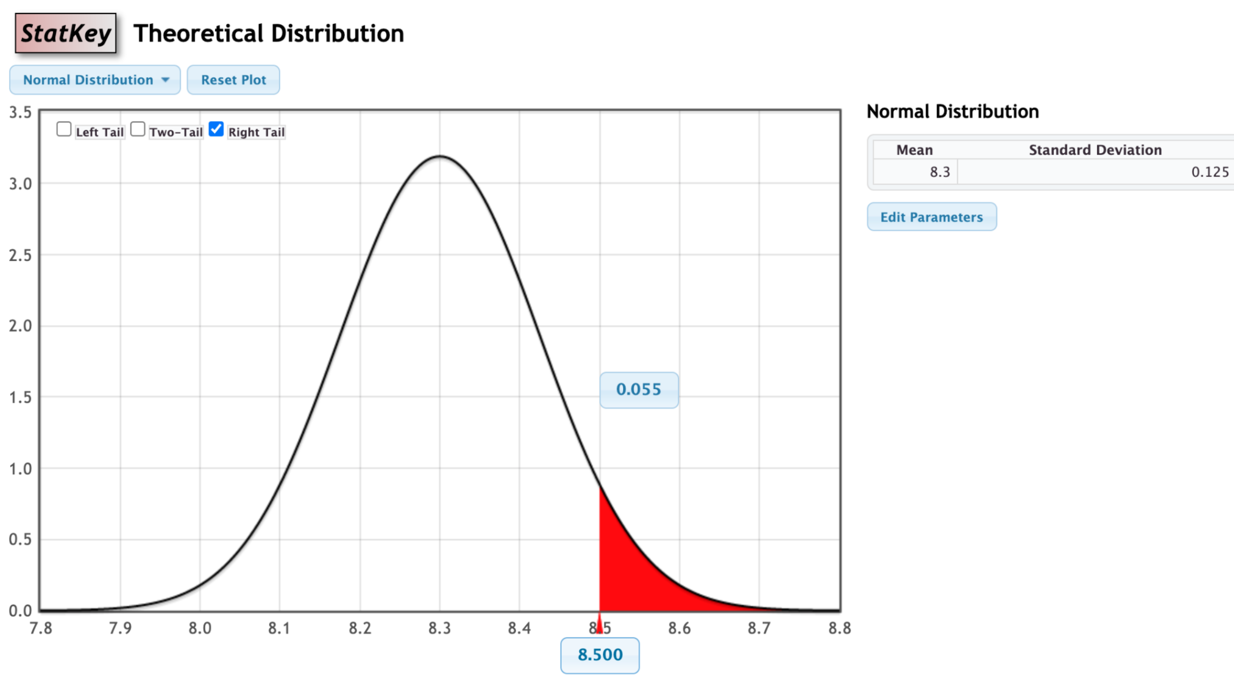
14. We seek the cutoff so that the area in the right tail is 0.001. That occurs when we make the cutoff z* = 3.09.



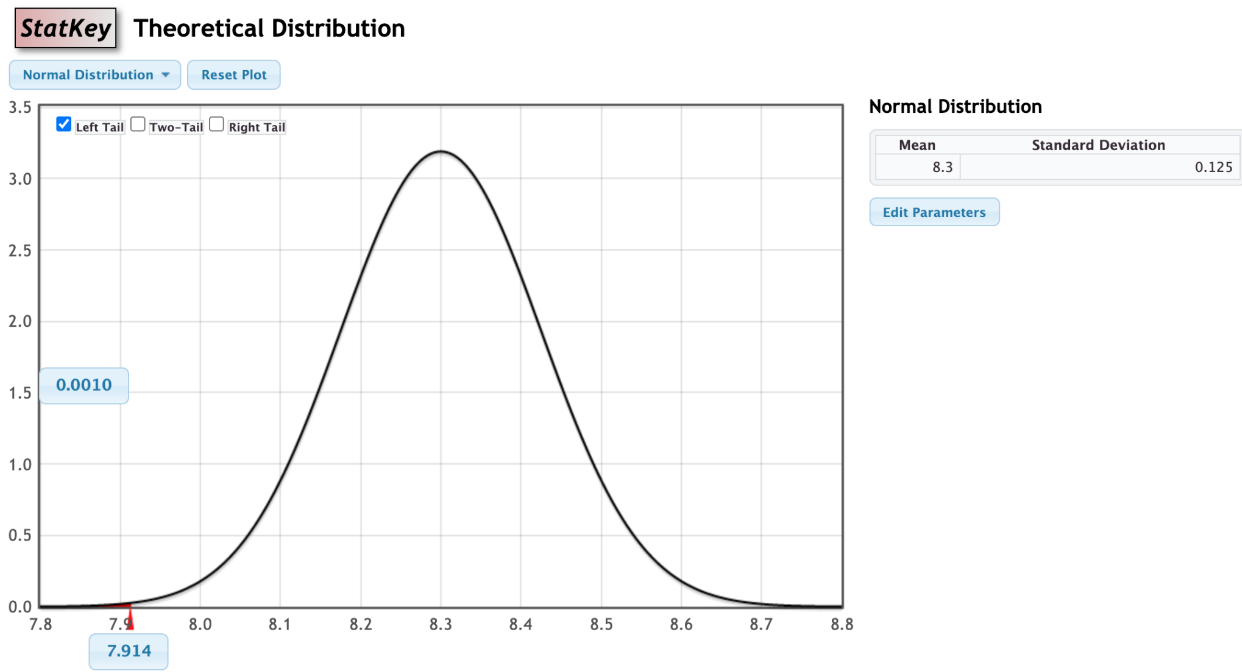
15. For the first time with this problem, we switch away from the standard normal distribution, to that of Normal(8.3, 0.125). We ask how often something to the left of 8 occurs by setting the left-tail's cutoff at 8, obtaining the answer 0.0082.



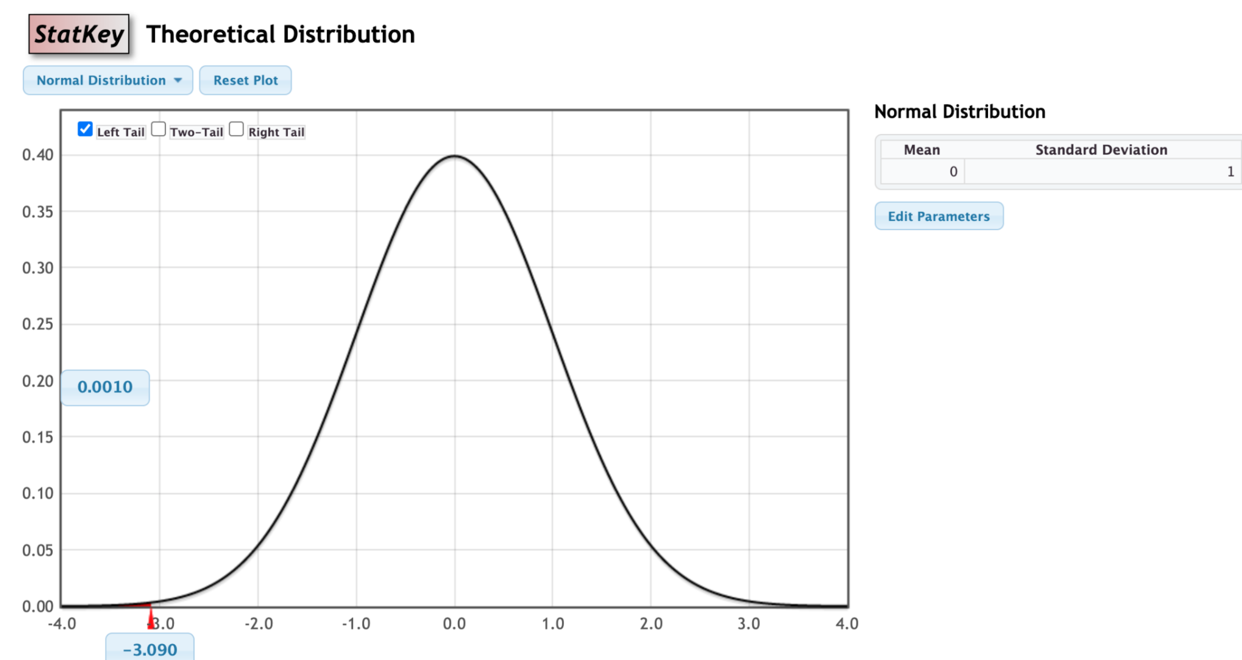
16. This is like Problem 15, but the wording "more than" tips us to the need to select the right-tail option. The answer is 0.055.



17. This, again, requires the Normal(8, 0.125) distribution, but now we set the left-tail area and read the cutoff from the result. The cutoff is 7.914.



18. This problem and the next are the most difficult to solve. In Problems 1-17 you had the mean and standard deviation. Each, then was either "given a cutoff (or cutoffs), find the area", or "given the area, find the cutoff. For Problem 18, the one unknown is the mean, which you must determine given the standard deviation, the cutoff, and the area. I suggest a 2-step process. First, use the standard normal distribution (the one with mean 0 and standard deviation 1) to find the Z-score of the cutoff.



Now that we know a Z-score of -3.09 relegates the left-tail area to be 0.001, use the standardization equation Z = (X - mu) / sigma, inserting the advertised weight 8 as X, and 0.125 as sigma, then solving for mu:

$-3.09 = (8 - mu) / 0.125 \quad \text{--->} \quad mu = 8 + (0.125)(3.09) = 8.386.$

19. Do likewise as in Problem 18, except this time you will know mu, but not sigma.

$-3.09 = (8 - 8.3) / sigma \quad \text{--->} \quad sigma = (8 - 8.3) / (-3.09) = 0.0971.$