# STAT 515 - Section 8.6 Supplement

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Once the power has been calculated (like in the example on pages 359-361), it is necessary to have a way of easily displaying those results. One of the most common ways of doing this is to simply plot the power at each of the possible values of the parameter. So, for the example we would need to plot the points:

a) μ=2,400 power= 0.05
b) μ=2,425 power = 1 - 0.7764 = 0.2236
c) μ=2,450 power = 1 - 0.4522 = 0.5478
d) μ=2,475 power = 1 - 0.1562 = 0.8438


Power Curve for Figure 8.18
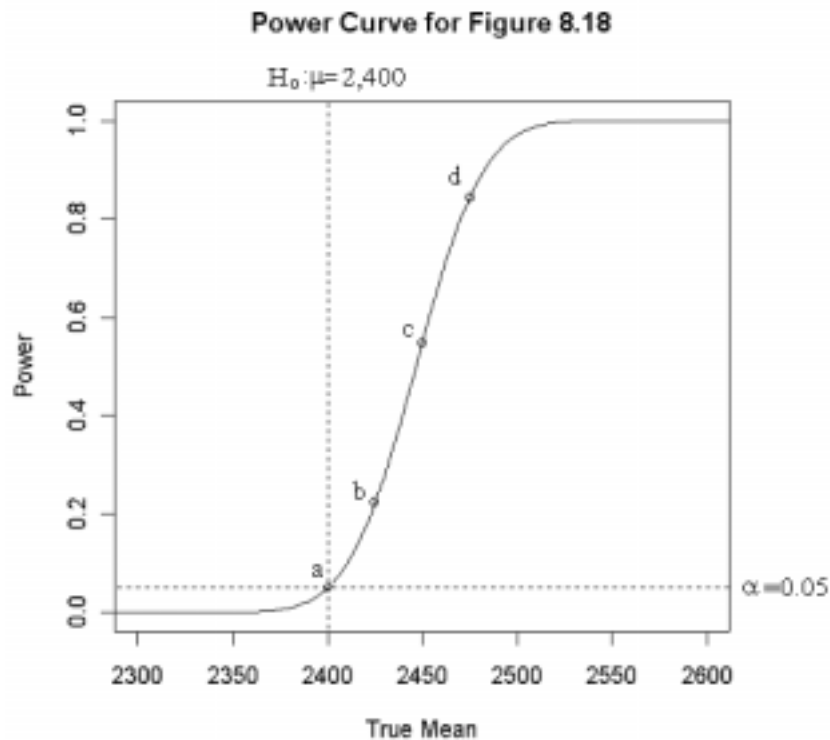
Looking at the above curve then we can see what the probability of correctly rejecting the null hypothesis for each of the possible true values of the mean. For example the test has a nearly 100% chance of performing correctly if the actual mean is greater than 2525. On the other hand it is less than 20% chance of it performing correctly if the actual mean is less than 2410.

Why is it that the curve will always pass through the point corresponding to the null hypothesis value and the α-level? Why will it always go to zero or one at the extremes?

It is certainly time consuming to calculate the values of a power curve by hand, but many computer packages will do so for you. In any case there are three distinct shapes that the curve will take based on the alternate hypothesis. For a tests of "greater than" the curve will look like the one above, rejecting more often for large values, but not rejecting for small values.

Once you know that the a-level is 0.05, you should be able to determine both the null and alternate hypotheses that the power curves below correspond to.
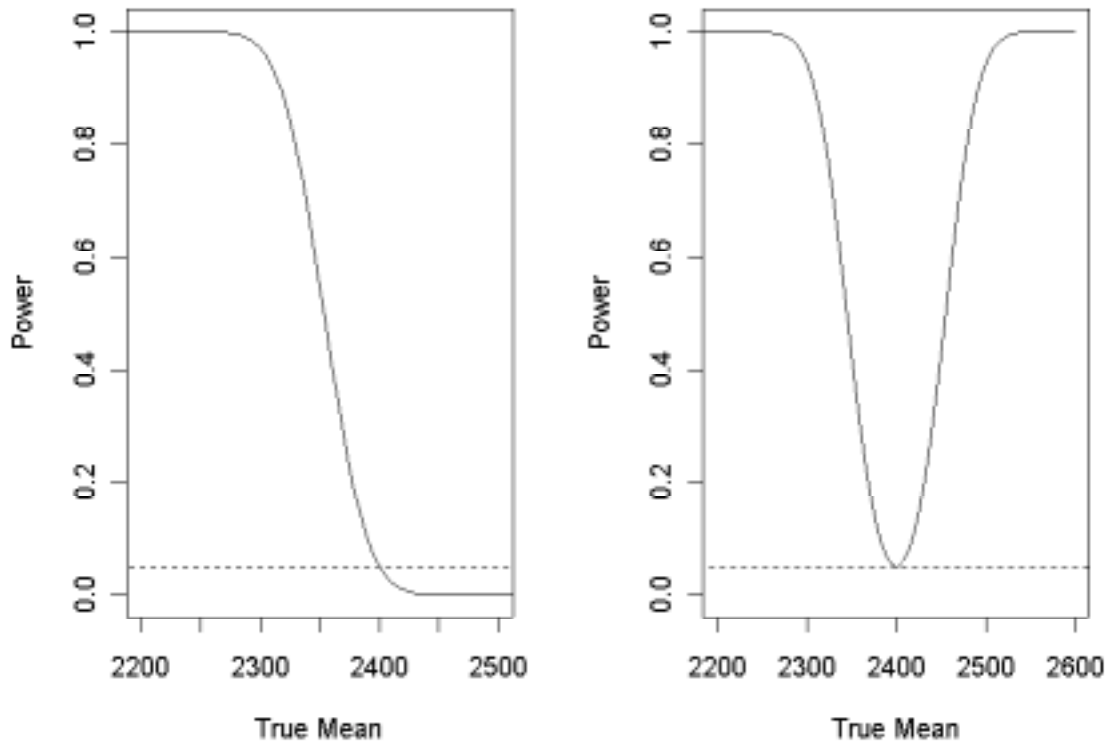
Similarly, if you are given H_0, H_a, and α you should be able to sketch the shape that the power curve will generally look like.