Problem Set #5

1a. If we have

So,

Then consider each case for c:

1b. Using equation 14 from Lecture 11:

Which is the largest probability of type I error:

1c. Plugging in to b:

2a. Following the notes with :

We then take as shown in Lecture 11:

2b. Finding the power under :

Plug in c from part a:

2c. Taking the limit for :

For :

3a. Normal Wald Test for :

We can find the estimator of :

This is a maximum because the second derivative is always negative:

Next, we find the standard error using asymptotic normality from Lecture 10:

Therefore, we can construct the test. We reject the null hypothesis when