EE 340 – Spring 2016
Assignment # 2

Consider a 3-phase, 60 Hz, 345 kV transmission line with a total series impedance $Z = 0 + j200 \ \Omega$ and shunt admittance $Y = j 0.001 \ \text{S}$. Assume the sending end is connected to a stiff 345 kV voltage source.

1. Determine the voltage at the receiving end under no load. Now suppose that the receiving end is supplying a pure resistive load.
   a. Determine the load power demand when the receiving end voltage is equal to the sending end voltage.
   b. Determine the maximum power that can be transferred by the transmission line, and the corresponding receiving end voltage.
2. Now assume that both ends of the line are connected to stiff voltage sources, each equal to 345 kV. Herein, real power flow is controlled by the angular difference between the two sources. Determine the maximum power transfer between the two sources.
3. Verify all the results above using Spice.