EE 340 – Spring 2017 – Assignment # 3

Consider a 500 kV transmission line with total series impedance = j100Ω and total shunt admittance = 0.0008 S. the line is connected to a stiff source that is fixed at the sending end (Vs = 1 pu). Assume the load is of constant power type.

1) Plot the receiving end voltage as a function of load real power for a) 0.9 power factor (lag), b) unity power factor, and c) 0.9 power factor (lead).

2) Plot the source reactive power Qs as a function of receiving end voltage for the following load powers: a) P = 0 MW, b) P = 500 MW, c) P = 1000 MW and d) P = 1500 MW, e) 2000 MW.