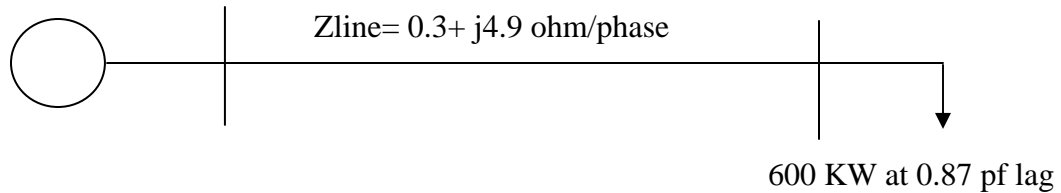


EE431/542 Power II

1. Shown below is a one line diagram for a balanced, three-phase, 60 Hz power system



- A. If the load voltage is to be kept at 4160 V calculate

Source voltage  
Source complex power  
Power loss in line

- B. A power factor correction capacitor is to be connected in parallel with the load to improve the power factor to 0.95 lag. Assuming the voltage at the load remains at 4160 V, calculate

The KVAR rating of the capacitor  
The value of capacitance per phase for a wye connected bank  
Source voltage  
Source complex power  
Power loss in line

Now tell me the benefits of power factor correction

- C. Back to part A. I want to rephrase the problem. The source voltage is 4160V; find the voltage at the load.



3. Can the line in problem 2 transport 1000 MW at 0.92 power factor lagging. Analyze any which way needed and justify your answer.