ECE 330 homework assignment #2 (In class quiz – Fri, Sep 15)

Text problem 2.16 (partial answer: 1 line = 1.255Amps, P+jQ tot = 600 +j450 MVA)

Text problem 2.17

Text problem 2.19

Text problem 2.20

Text problem 2.25

Special problem #1

A balanced, 3-phase, 3-wire, 60Hz, Wye-connected source is serving a combination of balanced loads in various configurations. Measurement of the source line voltage indicates 480 Volts (line to line). Measurement of the source line current indicates 23 Amps. When 8 KVAR of capacitance (3-phase) is added in parallel to the other loads, the source voltage stays the same and the source line current changes to 18 Amps.

What is the total 3-phase original load in Watts and Vars?
(Partial answer: 14,153 Watts)

Special problem #2

The following three-phase, balanced loads are connected across a three-phase, wye-connected source (60 Hz and 480 V – line to line). The nature of the three loads are described below:

Load #1: Wye-connected load with 100 kVA (3-phase) at 0.9 PF lag;
Load #2: Wye-connected load with 60 kW (3-phase) at 0.7 PF lead;
Load #3: Delta-connected load, with 75 A phase current and 0.9 PF lag.

Calculate the following:

a) The total complex power (3-phase) consumed by the three loads
b) The magnitude of the total source line current (answer: 300 Amps)
c) The capacitive reactive power per phase needed to be added to the delta connected load to make the overall PF equal to 1.0 (total for all loads).
d) The magnitude of the total source line current after the power factor correction of part c)