ET 332b
Three-Phase Power Calculations

A 480 V line-to-line 60 Hz 3-phase power system supplies three loads:

1.) A 3-phase delta connected induction motor that has a line current of 200 A at a power factor of 70% lagging.
2.) A 3-phase delta connected 100 hp induction motor. This motor is operating at 80% of its rated power output and has an efficiency of 92% and a power factor of 0.80 lagging.
3.) A delta connected resistive heater that draws 50 kW from the 3-phase supply.

For this system:
a.) Find the total P Q, S and power factor for the combined loads
b.) Find the per phase voltage rating and value of capacitance for a delta connected capacitor bank that is used to correct the power factor of the combined loads to 0.95 lagging.
c.) Find the magnitude of line current for the total connected load when:
    1.) power factor is that computed in part a
    2.) power factor is corrected to 0.95