Related reading and lectures: Sections 7.7.7 and 9.1 thu 9.3 of text, related lectures and problem-solving sessions.

Comments and Background:

Homework problems are designed to reinforce key concepts introduced in class. If you work the problems thoroughly, grasp the underlying concepts, and develop some insights, you should do very well on the tests.

Focusing on concepts and developing good engineering intuition is vital to us in our careers. In order to correctly analyze and design things, we must understand the underlying concepts and assumptions, choose or derive the correct equations, and develop a feeling for whether the calculations are correct.

I encourage you to use this opportunity to develop a sound and efficient approach to problem solving and documentation. Where did the equation come from? What simplifying assumptions have you made? Always sketch out the circuit first. Make your diagrams "plenty big" so you can clearly label voltages, currents, polarities, sources, impedances, etc. Circle important answers or solutions. Use tables to organize data and results. Develop a clear style of writing and sketching - could someone take your work out of the project archives 20 years from now and follow what you did?

H8.1 - An industrial consumer has 480-Volt 3-phase service with total load of 100kW and PF of 0.6 lag. They wish to improve their power factor to 0.95 lag.

a) Draw the "before" power triangle. Calculate and label P, Q, S, and θ.

b) Draw the "after" power triangle.   Calculate and label P, Q, S, and θ.

c) Calculate the Q rating of the shunt cap bank required to correct the power factor.

d) Assuming this cap bank is to be Y-connected, specify the rated Q, Voltage, reactance in ohms, and capacitance in uF of each phase.

e) Assuming this cap bank is to be Δ-connected, specify the rated Q, Voltage, reactance in ohms, and capacitance in uF of each phase.

H8.2 - Do problem 9.6 in your text book.

H8.3 - Do problem 9.7 in your text book.

H8.4 - Do problem 9.10 in your text book.

H8.5 - Do problem 9.11 in your text book.

H8.6 - Do problem 9.12 in your text book.