Two handout problems were given earlier. They were labeled H4-1 and H4-2.

H4.1 - Do Problem 4.2 in the text. Learn the basic relationships for magnetic circuits. In addition to parts a-c, answer the following:

   d) The device being analyzed is an inductance. What is the value of $L$ of original circuit?
   e) What is the value of the inductance of the modified magnetic circuit?

H4.2 - Do Problem 3.26 in the text. This is a typical situation in which the impedance of the lines between the source and the load cannot be neglected (as in the typical industrial facility - Ford, 3M, Intel, etc). Hint: convert the delta load into its equivalent wye and then combine the line and load impedances.

H4.3 - Do problem 3.14 in your text. This is an example of the how a low power factor lagging load can be improved to a high power factor load by adding a capacitor in parallel with the load. USE a power triangle to solve this problem - it will make the solution very visual and easier to understand.

H4.4 - Do problem 4.11 in your text. “Infinite permeability” means that the reluctance of the magnetic core is zero, so the total reluctance of the magnetic path is due only to the air gap.

H4.5 - Do Problem 4.15 in your text. Refer to the equivalent circuit of Figs. 4.11-4.14, and Example 4.6. A

H4.6 - Do Problem 4.18 in your text. This is a very practical problem, where the voltage and power triangle of the load are known, and your job as an engineer is to calculate what the source voltage would have to be to hold the load voltage at its rated level. Load power factor can have a big effect on the results.

H4.7 - Do Problem 4.21 in your text. This clearly illustrates how the transformer’s efficiency varies depending on applied voltage (which may vary between 95% and 105% of the rated voltage (and the load current) which may vary between 0% and 100% of the transformer’s rated load current capability. Note that as an engineer, you may have to make some economic evaluation calculations to decide which manufacturer’s transformer to buy for a plant expansion. Basically, we know that efficiency is power out divided by power in. The core (iron) losses vary according to the operating voltage squared, and the load (copper winding) losses vary according to the load current squared.

H4.8 - Do Problem 4.22 in your text. This illustrates how the transformer’s efficiency varies over the day as the load fluctuates.