ECE 330 homework assignment #3

Text problem 3.1 (and also find the magnetic flux density in the iron)  
(partial answer: $L = 6.1\text{ mH}$)

Text problem 3.2b (part b only)  
(partial answer: $L_{11} = 3.125\text{ mH}, L_{22} = 0.78125\text{ mH}$)

Text problem 3.3 (also compute the magnetic flux density in the center and outer legs)

Text problem 3.8 (partial answer: 971 AT)

Special problem #1

In the magnetic structure below, $\mu = \infty$ in the iron. All legs have the same cross sectional area, $A = 1\text{ cm}^2$. All gaps are equal in length, $g = 1\text{ mm}$. Neglect fringing. $N = 100$. The coils are connected in series so that both currents are equal.

a) Find the current necessary to generate a flux density in the center post of 1.0 T.
b) Find the total flux, $\phi$, in the center post (partial answer: 0.0001 Wb)
c) Find the flux linkage, $\lambda_L$, in the left-hand coil - assume the plus sign on top.