EE202 Homework 3 (Due Thursday, March 27, 2008)

i) Solve problems 9.66, 9.67, 9.70, given below (from Nilsson and Riedel, 7th edition)

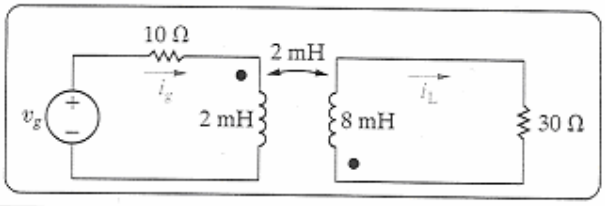
ii) Problem 9.66: Find the percentage of average power supplied by the source delivered to 30 Ω and 10 Ω resistors.

9.66 P

a) Find the steady-state expressions for the currents i_g and i_L in the circuit in Fig. P9.66 when $v_g = 70\cos 5000t$ V.

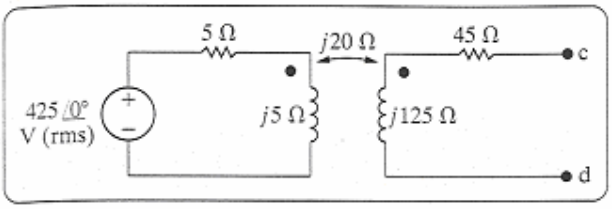
b) Find the coefficient of coupling.

Figure P9.66



9.67 For the circuit in Fig. P9.67, find the Thévenin equivalent with respect to the terminals c,d.

Figure P9.67



9.70 A series combination of a 300 Ω resistor and a 100 mH inductor is connected to a sinusoidal voltage source by a linear transformer. The source is operating at a frequency of 1 krad/s. At this frequency, the internal impedance of the source is $100 + j13.74$ Ω. The rms voltage at the terminals of the source is 50 V when it is not loaded. The parameters of the linear transformer are $R_1 = 41.68$ Ω, $L_1 = 180$ mH, $R_2 = 500$ Ω, $L_2 = 500$ mH, and $M = 270$ mH.

a) What is the value of the impedance reflected into the primary?

b) What is the value of the impedance seen from the terminals of the practical source?