1. A conductor is shaped in an irregular shape shown below. If the conductor is made of a material in which $R_0$ is 4 $\Omega/m$, what is the resistance between the left and right side of the conductors? If the space between the two ends is filled with a dielectric where $\epsilon_r = 2$, what is the capacitance between the two terminals? To do this derive an expression for $C_0$ similar to $R_0$.

![Conductor Diagram]

2. Calculate the resistance of a 1.5 meter long aluminum wire over a frequency range of 100 MHz to 2 GHz when a) the wire size is AWG # 12, and b) when the wire size is (AWG #37). Plot your results of AC resistance vs frequency.

3. You are asked to determine the inductance of a solenoid when the form length is 1.25 in., the form diameter is 0.3 in., and there are 12 turns.

   a) What wire diameter would you choose?
   b) What is the inductance?
   c) What is the self resonant frequency of the inductor?