

# Group Problem: Inductor

A solenoid has length  $l$ , radius  $a$ , and  $N$  turns

- 1) What is its self-inductance  $L$ ?
- 2) Charge to current  $I_0$  then release through resistor  $R$ . What is  $I(t)$ ?
- 3) What, as a function of time, is the electric field induced on its inner surface?
- 4) What is the Poynting vector there?
- 5) What is total power exiting (integrate  $S$ )?
- 6) Where is the power going? Prove it!