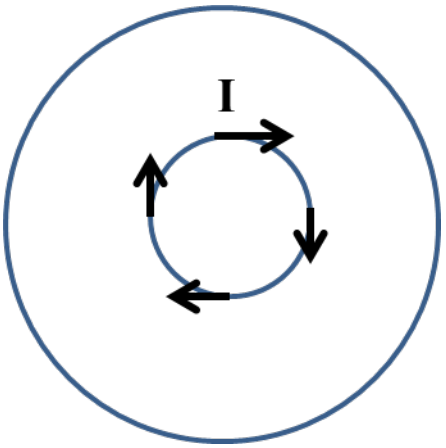
PREFLIGHTS **LESSON 4 – INDUCTANCE**

LEARNING OBJECTIVES:

1. **Describe the concepts of mutual inductance and self-inductance.**
2. **Determine the effect that inductance has on the emf of a conducting loop.**

1) Consider Example 7.10 in Griffiths. Describe conceptually why we are able to calculate the flux through the outer solenoid by finding the (imaginary) flux in the inner solenoid that would be produced if the current *I* were flowing through the outer solenoid.

2) Could we do a problem similar to Example 7.10 with two concentric current loops, in which a current *I* flows around the inner loop? If not, what is the difference between this situation and Example 7.10 that makes this problem more complicated?



3) Does it make sense that inductance only depends on the geometry of the problem? Why or why not?

4) Consider Example 7.11 in Griffiths. Why does the inductance of the toroid increase as the outer radius *b* increases relative to the inner radius *a*? If there is a current flowing through the toroid, what quantity, related to inductance, increases as *b* increases relative to *a*?

5) ***Note: This is a review question from Physics 361.*** Question ET7-TT1 from page 134 of *E&M TIPERs: Electricity & Magnetism Tasks* by Curtis J. Hieggelke, David P. Maloney, Stephen E. Kanim, and Thomas L. O'Kuma.

6) What did you find difficult or confusing in the pre-class work? If nothing was difficult or confusing, tell me what you found most interesting. Please be as specific as possible.

7) Document whatever help you received on the preclass work.