

ENERGY IN THE MAGNETIC FIELD

Prof. Stephen Sekula

11/12/2010

Supplementary Material for
PHY1308 (General Physics -
Electricity and Magnetism)

ANNOUNCEMENTS

- Homework 11:
 - Due Monday by 5pm (covers remainder of CH27)
- Next week:
 - Begin optics (last topic of course!)
- Next Exam
 - November 19, in class (Chapters 26-27)
 - I will be away next week on Thur. and Fri. (substitute exam proctors will be here on Friday)
 - Extra Office Hours! Mon: 2-4, Tue: 1-2:30, Wed: 1-2:30
 - Review Session: Tuesday Night, 7pm, FS157

EXTRA CREDIT #4

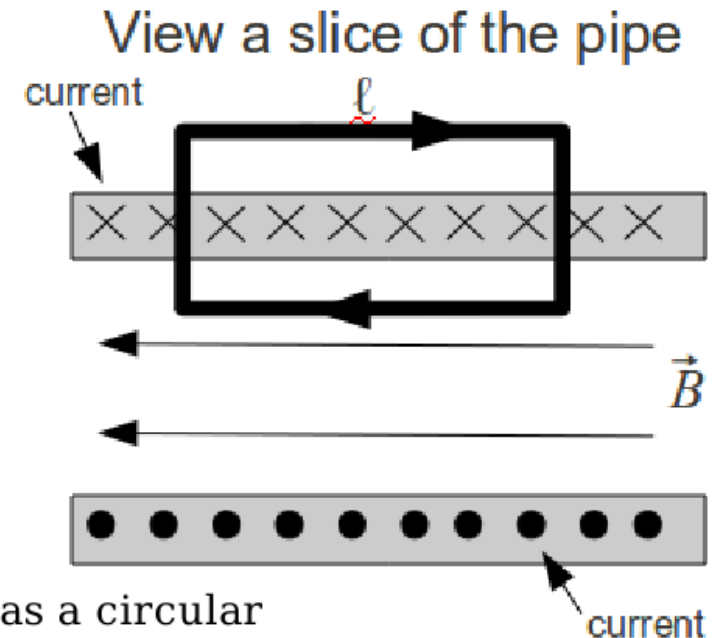
- Special Topics

- I will devote about 1 lecture at the very end of the course to "special topics" of your choosing
- Topics must be within physics but can be anything
- Extra Credit:
 - 5 points on the next exam for submitting a special topic suggestion
 - Required: a one-sentence description of the topic and one paragraph explaining why others in the class should learn about it
 - 5 more points if I choose your topic.
 - Multiple submissions on the same topic yield 5 additional points for all who suggest it, if it's chosen.

Submissions due by 9am Nov. 19

QUIZ 10

Part 1: (10 Points) A uniform current, I , is flowing in a conductive pipe of total length L (as shown below). Apply Ampere's Law to the path shown in the picture below, which encloses a part of the pipe length, ℓ . The magnetic field inside the pipe is uniform and non-zero and the magnetic field outside the pipe is zero. Show that the magnetic field inside the pipe is $B = \mu_0 I / L$.



Part 2: (10 Points) If the pipe carries a current of 5.0A and has a circular area with a radius of 1.0cm, what is the magnetic field flux through any area of the pipe?