Problem Set #6

Due Thursday, February 22, 2001

All problems are from *Physics*, by Halliday, Resnick, and Krane.

The Biot-Savart Law and Ampere's Law:

1. Chapter 35, Problem 14.

2. Chapter 35, Problem 39.

3. Chapter 35, Problem 46.

4. Three identical wires of length L are each fashioned into a loop --- one a circle, one a square, and one an equilateral triangle --- each carrying a current I.

   (a) Without doing any calculations, predict which loop produces the largest magnetic field at its center. Explain your reasoning.

   (b) Prove your answer to part (a) either right or wrong by actually calculating the magnetic field at the center of each of the 3 loops in terms of L and I and comparing the results. If your answers to (a) and (b) disagree, explain the discrepancy.