These are due Monday, 7 April.

1. Serway, Problem 32.5
2. Serway, Problem 32.10
3. Serway, Problem 32.11
4. Serway, Problem 32.15
5. Serway, Problem 32.23
6. Serway, Problem 32.33 (You saw this in the lab!)
7. Serway, Problem 32.41 (Naval applications, cool!)
8. Serway, Problem 32.64 (Check out Section 27.5!)

Bonus (2 points)

I noticed on the Exam that many people are still having trouble visualizing the three dimensional shape of the magnetic field lines surrounding a current carrying wire. Part of the problem is that without the use of vector calculus and curvilinear coordinates, we are relegated to the plane of the paper, and have to settle for a bunch of $\odot$s and $\times$s in the plane of the paper (or chalkboard), and terms like "clockwise".

For two extra points, find expressions for the following in (a) cartesian, (b) spherical, and (c) cylindrical coordinates:

- $d\mathbf{s}$ (an infinitesimal vector in an arbitrary direction)
- dV (an infinitesimal volume)
- ∇a (the gradient of a)
- $\nabla \cdot \mathbf{A}$ (the divergence of $\mathbf{A}$)
- $\nabla \times \mathbf{A}$ (the curl of $\mathbf{A}$)