1. **(75%)** Practice rotational motion problems by completing WeBWorK set # 7.

2. **(25%)** In the software download area of the Physics 121 website (located at http://teacher.pas.rochester.edu/phy121/Software/SoftwareIndex.htm) you will find a movie that shows a single puck spiraling inward on a horizontal air table. The inward spiral is caused by a falling mass that is attached to the spiraling air puck by means of a string that passes through a small hole at the center of the air table. Use video analysis to determine if angular momentum is conserved.

   Use the following steps in this analysis:

   a. Download the movie clip from the Physics 121 website.
   b. Start LoggerPro.
   c. From the "Insert" menu, select "Movie" to open the movie you want to analyze.
   d. At the bottom right-hand side of the video window you see a button with red dots with allows you to "Enable/Disable Video Analysis". Enable video analysis a set of tools will appear on the right-hand side of the video window.
   e. Select the ruler button to set the scale. Use the rulers on the left-hand side of the video to calibrate your screen. After selecting the ruler button you move your mouse to one end of the "ruler" in the video, click-and-hold your mouse button, move your mouse to the other end of the "ruler," and release the mouse button. A window will emerge, asking you for the length the "green line" you just drew on the screen.
   f. Using the "Set Origin" button (the third button from the top on the right-hand side of the movie window) to define the center of the table as the origin of the coordinate system.
   g. Use the "Add Point button" (the second button from the top on the right-hand side of the movie window) to define the center of the puck in each frame, using your mouse. Each time you select a position in a frame, the video will advance to the next frame.
   h. After completing your data entry you will see that the *x* and *y* positions and velocities for all frames in the data table. These data can be exported by selecting "Export as …. Text" from the file menu. The file created can be opened with Excel and you can use Excel to determine the angular momentum of the puck as function of time.

Do you expect angular momentum to be conserved? If yes, why? If not, why not?
Use the measured velocities and positions to determine the angular momentum of the puck with respect to center of the table and plot the angular momentum as function of time. Is angular momentum conserved?
The solution to this problem (the graph and your conclusions) needs to be dropped off in the Physics 121 homework locker in B&L, across from B&L 106. Please make sure your work is clearly labeled with your name.