PHY180F ASSIGNMENT 2 2004

Due: Thursday, September 30 (In the first 5 minutes of your tutorial)

1. Go to the web site http://www.upscale.utoronto.ca/PVB/Harrison/ErrorAnalysis/index.html (Error Analysis in Experimental Physical Science) and read section 5. Perform exercise 5.1 and answer questions 1, 2 ,3, 4 and 5 in exercise 5.1.

2. Using a diagram, express $\hat{r}$ in terms of $\hat{i}$ and $\hat{j}$ and express $\hat{\theta}$ in terms of $\hat{i}$ and $\hat{j}$.
   (b) Convert the vector $\vec{A} = \sin\theta\,\hat{r} - r\cos\theta\,\hat{\theta}$ to Cartesian coordinates.
   (c) Using a diagram, express $\hat{i}$ in terms of $\hat{r}$ and $\hat{\theta}$ and express $\hat{j}$ in terms of $\hat{r}$ and $\hat{\theta}$.
   (d) Convert the vector $\vec{B} = x\,y^2\,\hat{i} + x^2\,y\,\hat{j}$ to two dimensional cylindrical coordinates.

3. Chapter 15, number 20

4. Chapter 15, number 52. Hint: You may need to look up the energy stored in a stretched spring.