HOMEWORK 4, MATH 2331
DUE THURSDAY, FEBRUARY 4, 1999

Each problem is worth 5 points for a total of 30 points.

Any graph produced with Matlab must have a title (printed by Matlab) beginning with your name, and it must have labelled axes.

1. Do #2 on page 701. Include a good sketch done by hand.
2. Do #20 on page 709. Do the sketch by hand.
3. Use Matlab's plot3 command to do #24 on page 709. Use the rotate3d command to view the curve from many points, including extreme views such as with elevation equal to 90° or 0°. Print the view which you think best exhibits the curve. By hand, mark with arrow heads the direction of movement on the curve as t goes from 0 to 2π. By hand or by Matlab, mark and label the points on the curve where $t = 0, \pi/2, \pi$ and $3\pi/2$.
4. Do #32 on page 709. Hand in the following.
   (a) Your hand sketch of the curve as the intersection of the parabolic cylinder and the top half of the ellipsoid.
   (b) Your derivation of parametric equations for the curve.
   (c) The print out of the curve plotted with Matlab's plot3 command.
5. Do #2 on page 714. Do the sketches by hand on graph paper, or use Matlab's plot command to graph the curve $\mathbf{r}(t) = \langle t^2, t \rangle$, $0 \leq t \leq 2$, include a grid and print out the result on which you can do the remaining sketches.
6. Do #36 on page 715. By hand sketch the curve described by the solution $\mathbf{r}(t)$ and explain why this curve lies on a vertical cylinder. Knowing this latter fact will help you sketch the curve.