Due at the beginning of class on Wednesday, October 8

The following problems are to familiarize yourself with MATLAB, a powerful software package available through CITRIX. Any graphs you create should have views and domains that can show what is going on and have titles and axes labels.

Resources:

- `http://math.loyola.edu/~loberbro/matlab`
  In particular, look at the Citrix Info, Plotting Commands, Emailing Files, and Getting Started pages and others listed.
- Files on the **H-drive**: Found under "My Computer" in CITRIX, go to `shared on 'adfileprod01' (H:)`. Click on that. Then click on `Apps`, then `MatlabFiles`, then `ma351`, then `PlotExamples`. You should see a bunch of files listed in your "Current Directory" window on the left. Open and/or run these files, and maybe even save them to your drive so you can change and re-run them to experiment with the commands.

1. §13.1, #34.
   (a) On paper, show that the curve lies on a sphere. What is the equation for that sphere, and thus what is the center and radius?
   (b) Graph the vector function (parametric equations) in MATLAB. Notice that you may need to use more than 100 points in the domain to make it a nice, smooth graph. Save the commands to create this in a SCRIPT file named `Proj1Lastname1b.m`. Save the figure as a JPG file named `Proj1Lastname1b.JPG`.
   (c) Create a graph of the vector function again, along with graphing the sphere using the `hold on` command and the command `sphere`. Make the graph of the vector function black and thicker than the default setting. Save the commands to create this in a SCRIPT file named `Proj1Lastname1c.m` and save the figure as a JPG file named `Prof1Lastname1c.JPG`.
2. §13.2, #30
   (a) On paper, do part (a) of the problem, showing all work to get the equations of the tangent lines and the point of intersection.
   (b) Graph the vector function $\mathbf{r}(t)$, the tangent lines and the points. Make the vector function black, the first tangent line (where $t = 0$) blue and the second tangent line red. Mark the point of intersection of the lines with a black x. Save the commands to create this in a SCRIPT file named `Proj1Lastname2.m` and the figure as a JPG file named `Proj1Lastname2.JPG`.
3. §13.4, #18
   (a) On paper, do part (a) of the problem, showing all work.
   (b) Do part (b) in MATLAB for $t \in [0, 3]$. Save the commands to create this in a SCRIPT file named `Proj1Lastname3.m` and the figure as a JPG file named `Proj1Lastname3.JPG`.

TO TURN IN:

1. Your answers and work for problems 1, 2, and 3 (due at the beginning of class) with the SCORE SHEET STAPLED ON TOP.
2. The script files and the JPG files, emailed to me by the beginning of class.
   THE SUBJECT OF THE EMAIL SHOULD BE "MA351 PROJECT 1".
   If you're unsure how to email these files, see
   `http://math.loyola.edu/~loberbro/matlab/EmailingFiles.html` or talk to me.