

Due on Wednesday, November 5

Resources:

- The MATLAB website (found on Blackboard and class website) and resources listed there.
- As usual, the files found in the H-drive. In particular, the files in the `PlotExamples` directory have comments explaining some of the commands you can use to plot surfaces in 3D.
- Any of the Chapter 14 files on the H-drive.
- TIP: save these to your own drive and change/experiment with them to learn how some of the commands work.

Instructions: Complete the problems listed on the back on your own sheet(s) of paper. Graphs should have appropriate views with titles and axes clearly labeled (not handwritten); points will be taken off otherwise. **You may not ask other students for help on these problems, although you may ask for my help.**

TO TURN IN:

1. This sheet, on top and stapled to the hand-written work for each of the problems (turned in at the beginning of class), written neatly.
2. The script files and JPG files, emailed to me with the subject line “MA351 PROJECT 2”

POINT SYSTEM:

The project is out of a total of 15 points. Each problem is worth 4 points. In addition, I will appoint one point for the additional specifications and directions (must do all of it to receive the point):

____/ 4 points	Problem 1: §14.4, #8
____/ 4 points	Problem 2: §14.6, #46
____/ 4 points	Problem 3: §14.7, #38
____/ 1 point	Files sent appropriately (with correct filenames, filetypes, etc.) Work turned in is neat and stapled.
____/ 1 point	Script files are commented and run correctly to generate the graphs without extraneous output in the command window. The first line of each script file should be a comment with your name, Project 2 and the problem.
____/ 1 point	Graphs have appropriate domains, views, titles and the axes are appropriately labeled.
____/ TOTAL	

1. From the book, section 14.4, #8. Show all work on your paper to find the equation of the tangent plane. Graph both the surface and the tangent plane on the same figure, using appropriate domains and views. Graph it twice, the second figure should be “zoomed in” (by using different domains) to show how the tangent plane can be used as an approximation near the point. Make sure you rotate your graphs before you save them to show a decent view. Save your graphs as JPG files called `Proj2_1aLastname.JPG` and `Proj2_1bLastname.JPG`. Save your script files that create these as `Proj2_1aLastname.m` and `Proj2_1bLastname.m`, respectively.
2. From the book, section 14.6, #46. Show all work on your paper to find the equations. Graph the surface, tangent plane and normal line, using appropriate domains and views. Save your graph as a JPG file called `Proj2_2Lastname.JPG` and the script file to create it should be called `Proj2_2Lastname.m`
3. From the book, section 14.7, #38. Show all work on your paper to find the critical point and show that is a local maximum using the second derivative test. Find at least one point in which the value of $f(x, y)$ is larger than at the critical point. Generate three different graphs of the surface with the critical point marked with a black `x` (you may need to change the size of the marker to see it). The graphs generated should not only show what the book is discussing in the problem, but demonstrate the importance of using appropriate domains. The first graph should use the domain $[-5, 5] \times [-5, 5]$. The second graph should use the domain $[0.5, 1.5] \times [-0.5, 0.5]$. The third graph should use the domain $[-2, 2] \times [-0.5, 0.5]$. Your graphs should be appropriately labeled with a clear view of what the problem is asking you to show (make sure you rotate your graphs before you save them to show a decent view). The graphs should be saved as a JPG files called `Proj2_3aLastname.JPG`, `Proj2_3bLastname.JPG`, and `Proj2_3cLastname.JPG`, respectively. Save the script files to create them and call them `Proj2_3aLastname.m`, `Proj2_3bLastname.m`, and `Proj2_3cLastname.m`, respectively.