

Matlab 1 – due March 4, 2005

Math 241H

You are encouraged to work on these problems in groups of two or three. Each group should turn in only one copy of the assignment, but put all your names on the assignment you turn in. Your assignment should include a printout of your Matlab session (i.e., the Matlab commands you gave and the Matlab's responses) as well as your graphic output.

Problem 1. Use numerical integration using the Matlab command `quad` to find the length of the curve $\mathbf{r}(t) = (e^t, t^2, \sin(t))$, $0 \leq t \leq 1$. (The exponential function e^t is `exp(t)` in Matlab.) You will need to figure out which function to integrate.

Problem 2. Print out a plot of the curve with parametrization $\mathbf{r}(t) = t \cos(t)\mathbf{i} + 2t \sin(t)\mathbf{j} - t\mathbf{k}$, for $-3\pi \leq t \leq 3\pi$.

Problem 3. Print out a plot of the curve with parametrization $\mathbf{r}(t) = \mathbf{i} + t\mathbf{j} + \sin(1/t)\mathbf{k}$, for $0.001 \leq t \leq 1$.

Problem 4. Print out a graph and a contour plot for the function

$$f(x, y) = (x^3 - 3y^2)\exp(1 - x^2 - y^2)$$

for $-2 \leq x \leq 2$ and $-3 \leq y \leq 3$.