

## Math 411 Hwk 5

**Problem 1** (50 points). Write a Matlab function `bezier`, which takes as input the control points  $\{(x_j, y_j)\}_{j=0}^n$  and returns the polynomial coefficients corresponding to the bezier curve defined by the control points. In addition, if the ordered sample points  $\{t_k\}_{k=1}^m \subset [0, 1]$  are also included as input, produce a graph of the bezier curve (including the control points). Be sure also to include well-written and complete documentation in your code so that a user will be able to know how to execute your code by typing `help bezier`.

**Problem 2** (25 points). Write a Matlab function `upBezier`, which takes as input the control points  $\{(x_j, y_j)\}_{j=0}^n$  and returns a new set of  $n + 1$  control points  $\{(\tilde{x}_j, \tilde{y}_j)\}_{j=0}^{n+1}$  which has the exact same Bezier curve.

**Problem 3** (25 points). Write a Matlab script to produce the letter “G” using Bezier curves. Write your script in a way that will allow you to rescale your letter by only changing one number. The student who turns in the best letter will get a 100 point bonus.