

CS 779
Fall 2002
Assignment 3
Due: Monday, November 4

1. (5 points) Page 194, exercise 1.
2. (5 points) Page 218, exercise 1.
3. (10 points) Page 228, exercise 4.
4. (10 points) Page 235, exercise 2.
5. (20 points) Extend your curve editor from assignment 2 to draw cubic Bézier curves using the de Casteljau algorithm, with the following features:
 - Left mouse to place new point.
 - Right mouse to click-and-drag existing point.
 - Menu option to clear curve from screen
 - Menu option to switch between Lagrange, Hermite, and Bézier drawing.
 - Menu option to select between drawing
 - Just the curve
 - The curve plus the control points (which should be labeled P0, P1, etc.).
 - The curve plus the control points (labeled or unlabeled, your choice), plus the lower degree curves used to construct the curve. For example, for a degree curve, your display should look similar to somewhat similar to Figure 5.24. There is **no** need draw your curves in different colours.

You should be able to draw Bézier curves with at least degree 20.

Since there is a single segment, there is no need to specify nodes.

6. (Extra credit: 5 points) Add a “change of basis” menu, that lets you switch from the current representation (Lagrange, Hermite, Bézier) to one of the other representations. Note that when changing from Hermite to one of the other bases, you only need to convert the first cubic Hermite segment.