《Computer-Aided Geometric Design》

Assignment 4

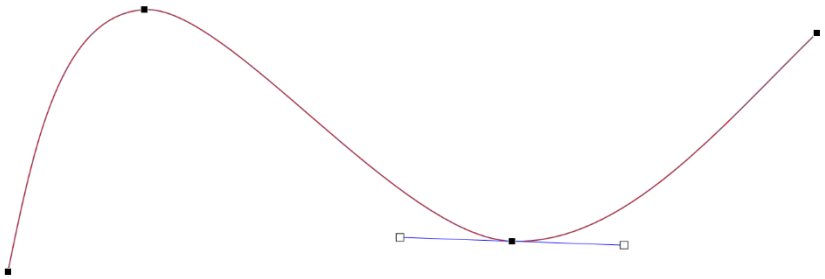
October 13, 2025

1. Prove: Let $f(x) \in C^2[a,b]$ be any interpolating function, and $S(x)$ be the natural interpolating cubic spline function (with second derivative equal to zero at both endpoints), then:

   $\int_a^b [S''(x)]^2 dx \leq \int_a^b [f''(x)]^2 dx$

   where the equality holds if and only when $f(x) \equiv S(x)$.

2. Implement an interactive program for generating cubic Bézier spline curves. Reference the interactive interface of the drawing tool in Microsoft Word or PowerPoint under "Insert" - "Shapes" - "Curve":



Submission deadline: Evening of October 21, 2025
