4. (a) State the Bezier formula. What is the Bezier matrix for a **cubic** spline? [7]

   (b) A **quadratic** spline is specified by the equation

$$\mathbf{x}(u) = \mathbf{U}\mathbf{B}^{-1}\mathbf{b}$$

   where $\mathbf{U}$ is the row matrix of powers of u, $\mathbf{B}^{-1}\mathbf{b}$ are the constraints for the curve. If a curve passing through the two points $\mathbf{p}_0$ and $\mathbf{p}_1$ is to be first-order continuous at $\mathbf{p}_0$, derive an expression for $\mathbf{x}(u)$ in terms of the endpoints and $d\mathbf{x}(u)/du$. [12]

   (c) How would you control a piecewise spline of the form given in (b)? Why might interpolating splines be preferred to approximating splines in drawing programs? [6]