3 Computer Graphics and Image Processing (PR)

Given a sequence of points $(V_i)_{i=0}^{n}$ on a plane, consider the problem of interpolating a smooth curve through all of the points in order by constructing a sequence of polynomial parametric functions, one for each interval $[V_i, V_{i+1}]_{i=0}^{n-1}$.

(*a*) What is meant by C_k continuity at the junction between two curve segments? [2 marks]

(*b*) Explain how the degree of the polynomial function for a curve segment constrains the continuity at its two ends. What continuity can be achieved at each end of a cubic segment? [4 marks]

(*c*) Derive a cubic parametric function for the interval $[V_i, V_{i+1}]$ where $0 < i < n-1$. [10 marks]

(*d*) What special provision would have to be made for the segments $[V_0, V_1]$ and $[V_{n-1}, V_n]$? [4 marks]