Rendering of B-Spline Curves

Given a set of $n$ control points $P_1, P_2, ..., P_n$, one can define a cubic (uniform) B-spline curve with $(n - 3)$ segments.

The $i$-th segment $C_i(t)$, $1 \leq i \leq n - 3$, is defined by control points: $P_i, P_{i+1}, P_{i+2}, P_{i+3}$.

How should each B-spline curve be rendered?
1. Use the definition of a (cubic) B-spline curve segment directly (brute force or forward differencing).

\[ C_i(t) = \frac{(1-t)^3}{6} P_i + \frac{(4-6t^2+3t^3)}{6} P_{i+1} + \frac{(1+3t+3t^2-3t^3)}{6} P_{i+2} + \frac{t^3}{6} P_{i+3} \]

for \( 0 \leq t \leq 1 \)

2. Convert to (cubic) Bezier representation and then use (i) mid-point subdivision to approximate the curve (pages 251-253), or (ii) the code provided in the sample program (pages 222-224) to render the curve segment.