Oder 3 set b E I

Answer:

$P_1 = P_3 = (6, 4)$

Step-by-step explanation:

Bezier curves can be generated under the control of other points. Approximate tangents by using control points are used to generate curve. The Bezier curve can be represented mathematically as –

$\sum_{k=0}^{n} P_i B_i^n(t)$

Where pi is the set of points and Bni(t)Bin(t) represents the Bernstein polynomials which are given by –

$B_i^n(t) =_i^n (1-t)^{n-i} t^i$

Where n is the polynomial degree, i is the index, and t is the variable.

The equation for the Bezier curve is given

as:-

$P(U) = (1-U)^3 P_1 + 3U(1-U)^2 P_2 + 3U^2(1-U)P_3 + U^3 P_4$

for $0 \leq u \leq 1$ where P(U)

is the point on the curve P_1, P_2, P_3, P_4

Let us take $U = 0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$

Therefore, $P(0) = (1, 1)$

$P(1/4) = (1-1/4)x^3 P_1 + 3\frac{1}{4}(1-1/4)x^2 P_2 + 3(1/4)x^2(1-1/4)P_3 + (1/4)x^3 P_4$

$\Rightarrow \frac{27}{6^2}(1, 1) + \frac{27}{64}(2, 3) + \frac{9}{64}(4, 3) + \frac{1}{6^4}(6, 4)$

$P(1/4) = (1-1/4)x^3P_1 + 3\frac{1}{4}(1-1/4)x^2P_2 + 3(1/4)x^2(1-1/4)P_3 + (1/4)x^3P_4$

$\Rightarrow \frac{27}{6^2}(1,1) + \frac{27}{64}(2,3) + \frac{9}{64}(4,3) + \frac{1}{6^4}(6,4)$

$\Rightarrow [\frac{27}{64} \times 1 + \frac{27}{64} \times 2 + \frac{9}{64} \times 6, \frac{27}{64} \times 1 + \frac{27}{64} \times 2 + \frac{9}{64} \times 3 + \frac{1}{64} \times 4]$

$\Rightarrow [\frac{123}{64}, \frac{139}{64}]$

$= (1.9218, 2.1718)$

$P(\frac{1}{2}) = (1-\frac{1}{2}^3)P_1 + 3\frac{1}{2}(1-\frac{1}{2})^2P_2 + 3\frac{1}{2}^4(1-\frac{1}{2})P_3 + \frac{1}{2}^3P_4$

$\Rightarrow \frac{1}{8}(1,1) + \frac{3}{8}(2,3) + \frac{3}{8}(4,3) + \frac{1}{8}(6,4)$

$\Rightarrow [\frac{1}{8} \times 1 + \frac{3}{8} \times 2 + \frac{3}{8} \times 4 + \frac{1}{8} \times 6, \frac{1}{8} \times 1 + \frac{3}{8} \times 3 + \frac{3}{8} \times 3 + \frac{1}{8} \times 4]$

$\Rightarrow [\frac{25}{8}, \frac{23}{8}]$

$= (3.125, 2.375)$

Therefore, $P(\frac{3}{4}) = (1-\frac{3}{4})^3P_1 + 3\frac{3}{4}(1-\frac{3}{4})^2P_2 + 3(\frac{3}{4})^2(1-\frac{3}{4})P_3 + (\frac{3}{4})^2P_4$

$\Rightarrow \frac{1}{64}P_1 + \frac{9}{64}P_2 + \frac{27}{64}P_3 + \frac{27}{64}P_4$

$\Rightarrow \frac{1}{64}(1,1) + \frac{9}{64}(2,3) + \frac{27}{64}(4,3) + \frac{27}{64}(6,4)$

$\Rightarrow [\frac{1}{64} \times 1 + \frac{9}{64} \times 2 + \frac{27}{64} \times 4 + \frac{27}{64} \times 6, \frac{1}{64} \times 1 + \frac{9}{64} \times 3 + \frac{27}{64} \times 3 + \frac{27}{64} \times 4]$

$\Rightarrow [\frac{289}{64}, \frac{217}{64}]$

$= (4.5156, 3.3906)$

$P_1 = P_3 = (6,4)$