

- Introduction to Week Four
- Elementary Integration Formulas
- Composite Integration Formulas
- Quadrature in MATLAB
- Interpolation

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Video: Interpolation | Lecture 43

10 min
- ✓

Reading: Linear and Quadratic Interpolation

10 min
- ✓

Video: Cubic Spline Interpolation (Part A) | Lecture 44

15 min
- ✓

Reading: Cubic Spline Interpolation with Endpoint Slopes Known

10 min
- ▶

Video: Cubic Spline Interpolation (Part B) | Lecture 45

10 min
- Ⓜ

Reading: Cubic Spline Interpolation with the Not-a-Knot Condition

15 min

- Interpolation in MATLAB
- Quiz
- Programming Assignment: Bessel Function Zeros

Cubic Spline Interpolation with Endpoint Slopes Known

Let $y = f(x)$ have known values $(x_0, y_0), (x_1, y_1), \dots, (x_n, y_n)$, and define piecewise cubic polynomials by

$$g_i(x) = a_i(x - x_i)^3 + b_i(x - x_i)^2 + c_i(x - x_i) + d_i, \quad \text{for } i = 0 \text{ to } n - 1 \text{ and } x_i \leq x \leq x_{i+1}.$$

Suppose that the endpoint slopes $f'(x_0) = y'_0$ and $f'(x_n) = y'_n$ are known. From these two extra conditions, determine two extra constraints on the a, b and c coefficients.

✓ Completed

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