

Introduction to Week Four

Elementary Integration Formulas

- ✓

Video: Midpoint Rule | Lecture 36
8 min
- ✓

Reading: The Midpoint Rule is the Area of a Rectangle
5 min
- ✓

Reading: Midpoint Rule for a Quadratic Function
10 min
- ▶

Video: Trapezoidal Rule | Lecture 37
8 min
- 📖

Reading: Derive the Trapezoidal Rule
10 min
- ▶

Video: Simpson's Rule | Lecture 38
6 min
- 📖

Reading: Derive Simpson's Rule
15 min

Composite Integration Formulas

Quadrature in MATLAB

Interpolation

Interpolation in MATLAB

Quiz

Programming Assignment: Bessel Function Zeros

Midpoint Rule for a Quadratic Function

Let $f(x) = a + bx + cx^2$, where a, b and c are constants. Prove by explicit calculation that

$$\int_0^h f(x) \, dx = hf(h/2) + \frac{h^3}{24} f''(h/2).$$

✓ Completed

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