

Introduction to Week Five

Initial Value Problems

- ✓

**Video:** Euler Method | Lecture 48  
7 min
- ✓

**Reading:** When the Euler Method is Exact  
10 min
- ✓

**Video:** Modified Euler Method | Lecture 49  
9 min
- ✓

**Reading:** When the Modified Euler Method is Exact  
10 min
- ✓

**Video:** Runge-Kutta Methods | Lecture 50  
12 min
- ✓

**Video:** Second-Order Runge-Kutta Methods | Lecture 51  
7 min
- ✓

**Reading:** Ralston's Method  
5 min
- ✓

**Reading:** Runge-Kutta Methods and Quadrature Formulas  
10 min
- ▶

**Video:** Higher-Order Runge-Kutta Methods | Lecture 52  
10 min
- ⌕

**Reading:** Fourth-Order Runge-Kutta Method and Simpson's Rule  
10 min

Systems of Differential Equations

Initial Value Problems in MATLAB

Boundary Value Problems

Quiz

Programming Assignment: The Two-Body Problem

# Runge-Kutta Methods and Quadrature Formulas

Consider the ode given by

$$\frac{dy}{dx} = f(x),$$

with  $y(0)$  as the initial value. Use the second-order Runge-Kutta methods given by the midpoint rule and the modified Euler method to derive two elementary quadrature formulas.

✓ Completed

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