

1. Solve the IVP $y' = 9x \exp(-3x)$, $y(0) = 1$ using Euler method, RK2 and RK4 in the domain $[0, 10]$ with the step size 0.5. Compare the results graphically.
2. Write a general function for Runge-Kutta Method of order 2 with one parameter c_2 as input (increment of t), and solve the IVP $x'' + 3x = \sin(t)$ with $x(0) = 1, x'(0) = 1$.
3. Solve the BVP $x'' + 3x = \sin(t)$ with $x(0) = 1, x(\pi) = 1$ using Finite Difference Method (FDM).