

Computer Project 4

Numerical Solutions to IVPs

DUE: Wednesday, December 7, 2022

Instructions: Use the version of RK-4 we implemented in the last Python project to graph the solutions to the following first order initial value problems. Solve each ODE on the interval $0 \leq t \leq 10$ with 10000 steps.

1)

$$\begin{aligned}\frac{dx}{dt} &= t - x^3 \\ x(0) &= 2\end{aligned}$$

2)

$$\begin{aligned}\frac{dx}{dt} &= \sin(tx) \\ x(0) &= 3\end{aligned}$$

3)

$$\begin{aligned}\frac{dx}{dt} &= \cos(x)(t^2 - x) \\ x(0) &= 0\end{aligned}$$

4)

$$\begin{aligned}\frac{dx}{dt} &= \frac{\cos(tx)}{t^2 + 1} \\ x(0) &= 1\end{aligned}$$