Homework #1 (due date: October 6)

1. (Computer Problem) Apply Euler's method with step size $h = 0.1$ on [0, 1] to the initial value problem $y' = \frac{1}{y^2},\ y(0) = 1$. Print a table of the t values, Euler approximations, and error (difference from exact solution) at each step.

2. (Computer Problem) Plot the Euler's method approximate solutions for the initial value problem $y' = t + y,\ y(0) = 0$. on [0, 1] for step sizes $h = 0.1,\ 0.05,$ and 0.025, along with the exact solution.

3. Consider the following method

$$y_{i+1} = y_i + \frac{h}{2}\left[f(t_i, y_i) + f(t_i + h, y_i + hf(t_i, y_i))\right]$$

Find the local truncation error of the method.