

# Math 3120-001: Homework

Due October 6, 2011

*Professor Z. Sinkala*

Your Name:.....

**Problem 1**

Use Scilab: Use Euler's method with step size  $h = 0.1$  to approximate the solution to the initial value problem

$$\frac{dy}{dx} = xy, y(0) = 1.$$

from  $x = 0$  to  $x = 40$ . Compare the graph of the exact solution and the approximation solution on the interval  $[0, 40]$  by graphing them on the same graph..

**Problem 2**

Use Scilab: Use Euler's method with step size  $h = 0.1$  to approximate the solution to the initial value problem

$$\frac{dy}{dx} = xy, y(1) = 1.$$

from  $x = 1$  to  $x = 40$ .

**Problem 3**

Use Scilab: Use Improved Euler's method with step size  $h = 0.1$  to approximate the solution to the initial value problem

$$\frac{dy}{dx} = xy, y(1) = 1.$$

from  $x = 1$  to  $x = 40$ .

**Problem 4**

Use Scilab: Use Runge Kutta method with step size  $h = 0.1$  to approximate the solution to the initial value problem

$$\frac{dy}{dx} = xy, y(1) = 1.$$

from  $x = 1$  to  $x = 40$ .