

MATH.2360 Engineering Differential Equations
Homework Assignment for Section 4.3 (Numerical Methods for Systems)

Name: _____

Consider the system

$$\begin{cases} x' &= -tx + y \\ y' &= x + \sin(t) \end{cases}$$

with initial conditions $x(0) = 1, y(0) = -2$.

1. Use the Runge-Kutta Method to generate an approximate solution to the initial value problem on the interval $0 \leq t \leq 1$ using $n = 2$ subintervals.
2. Use the Runge-Kutta Method to generate an approximate solution to the initial value problem on the interval $0 \leq t \leq 1$ using $n = 10$ subintervals.
3. Fill in the following table.

	R-K Method with $n = 2$	R-K Method with $n = 10$
$x(0.5)$		
$x(1)$		
$y(0.5)$		
$y(1)$		