Numerical Analysis Maple Project 5
Due November 27, 2002

Instructions: Use a word processor to create a single text file with Maple procedures implementing all algorithms required for the exercises below. Each procedure must use type checking, accept $f(t,y)$ as one of the input parameters (don't use type checking for that one), and return a value using the `return` statement. Read the file into Maple and test each procedure. Turn in the following:

1). A hard copy showing only your reading in the text file and testing the procedures.

2). An email message with your text file attached so that I can test your procedures.

3). A hard copy of your text file.

Write a Maple implementation of Algorithm 5.1 (Euler's method) and Algorithm 5.2 (Runge Kutta, Order 4). Each procedure should return a list of points. Ask me about defining a function of two variables in Maple.

1. Use both algorithms with $N = 20$ to solve the following initial value problem

$$\frac{dy}{dt} = t^2 + y^2, \qquad 0 \le t \le 2$$
$$y(0) = 0$$

Print out both sets of points.

2. Using Maple to plot both lists of points in one picture.

3. Compare and contrast the results obtained from the two methods.

Note: I expect you to work alone on this assignment. If you need help, please talk to ***me***.