Math 4513, Homework 5, Due on 11/30/2012

1. (10 points) Download `lgwt.m` from `http://www.mathworks.com/matlabcentral/fileexchange/4540`. Consider $\int_0^{\pi/2} x^2 sinx dx$. Compute its exact value. Then approximate the integral using Gaussian quadratures with $n = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$. Find the error for each n. (Use format long e in Matlab to get 15 digits of you answer.)

2. (10 points) Use Taylor's method of order 2 to approximate the solution for the following problem:

$$y' = 1 + (t - y)^2, \qquad y(2) = 1$$

Use step size $h = 0.5$ to estimate the value of $y(3)$.