Course 161/2S3, Tutorial, Hilary Term, 2006

- Use Simpson's rule to evaluate

  $$\int_0^1 5x^5 dx$$

  with n = 4.

  Comment on how the solution will change if $n = 8$ and $n = 2$. Compare your answer with the analytic result.

  What value of n is needed to solve this problem to an accuracy of 10^{-12} (approx machine precision).

- Given the first-order differential equation

  $$\frac{dy}{dx} = -y(x)$$

  and initial condition $y(0) = 1$. Determine $y(x), x = 2$ for a step size $h = 0.5$ using the Euler method.

  Note the analytic solution to this equation is $y(x) = e^{-x}$. See how your answer compares to the analytic solution.