1. Evaluate $\displaystyle\int \frac{x-3}{(x-4)^2(x-1)}\,dx$.

2. Let $g(x) = \sqrt{x}\,\sin x$.

   a. Approximate $\displaystyle\int_0^4 g(x)dx$ using $n = 8$ subintervals and the ...

      i.   Trapezoid Rule
      ii. Midpoint Rule
      iii. Simpson's Rule

   b. Calculate the following to 5 decimal places, using $\displaystyle\int_0^4 g(x)dx \approx 1.768748705$ as the

      actual value.

      i. E_T
      ii. E_M
      iii. E_S

   c. Find an upper bound for each of the following without a calculator (See Page 3 of
      Thursday, October 1st notes.)

      i. $\left|E_T\right|$
      ii. $\left|E_M\right|$
      iii. $\left|E_S\right|$

   d. Based on your work in part c., find a lower bound on n so that

      i. $\left|E_T\right| \le 0.001$
      ii. $\left|E_M\right| \le 0.001$
      iii. $\left|E_M\right| \le 0.001$