

Math 5600 Homework # 4(due April 3)

Note: For computational problems include the detailed output of your computations. For theoretical problems show your work. No credit will be awarded if the work is not shown.

1 (th,10 points)

Solve Problem 18, page 196 with $x_0 = -1$, $x_1 = 0$, $x_2 = 1$.

Note: There is a typo in the book. The Simpson's rule is exact for $f(x) = x^n$, $n = \underline{0}, 1, 2, 3$.

2 (th,10 points)

Problem 16, page 177.

Note: There is a typo in the book. The hint should be: consider the expression $Af(x_0 - h) + Bf(x_0) + Cf(x_0 + h) + Df(x_0 + 2h) + Ef(x_0 + 3h)$. Expanding in Taylor series will give 5 linear algebraic equations for A, B, C, D, E . You can solve the system symbolically using Maple (see pp. 352-353 for details).

3 (th,10 points)

Problems 12,13, page 212.

Hint: For problem 12 split the sum into two sums, over i odd and over i even.

4 (c,10 points)

Problem 1d, page 211.

5 (c,10 points)

Solve Problem 5, page 219 for $\sin \frac{1}{x}$. Plot the grid (x -values only) used to compute the integral.