

CMSC/AMSC/MAPL 460 Computational Methods Assignment 6
Due: Before class on 04/12/2007

1. Do problems 6.1, 6.3, 6.6 from the text (10 points each)

2. IN class we showed that for the trapezoidal rule the following error bound holds

$$\int_a^b f(t)dt - T = -\frac{(b-a)^3}{12} f''(\eta)$$

where $\eta \in [a, b]$.

Derive the error bounds for the Simpson's 1/3 rule by using the polynomial interpolation method shown in class for the trapezoid case.

In the case of the composite trapezoid rule over n intervals, with $h=(b-a)/n$, we showed in class that the error reduced to

$$\int_a^b f(t)dt - T_n = -\frac{(b-a)h^2}{12} f''(\eta)$$

for some $\eta \in [a, b]$. □

What does the error become if we use the composite version of the Simpson 1/3 rule in composite form over n intervals? (20 points)