

**Homework 7. (Due November 12, 2008)**  
Math 353 Section 12, Fall 2008, University of Delaware

MatLab Exercises

1. Exercise 5.2.6. (Computer Problems)
2. Use the
  - (a) Composite Trapezoid Rule
  - (b) Composite Simpson's Rule
  - (c) Composite Simpson's  $\frac{3}{8}$  Rule (see Exercise 2)

to approximate the following definite integral

$$(a) \int_0^3 \frac{\sin(2x)}{1+x^2} dx \quad (b) \int_0^1 e^{x^2} dx$$

with an accuracy of seven decimal places.

3. 5.3.2. ((a) and (e) only) (Computer Problems)

Exercises

1. If  $h = x_1 - x_0 = x_2 - x_1 = x_3 - x_2$ , then show that

$$E[f] = \int_{x_0}^{x_3} \frac{(x-x_0)(x-x_1)(x-x_2)(x-x_3)}{4!} f''''(c) dx = -\frac{3h^5}{80} f''''(c)$$

2. Derive a formula for composite Simpson's  $\frac{3}{8}$  rule.
3. Exercise 5.3.2.
4. Exercise 5.4.2.
5. Exercise 5.5.8.
6. Exercise 5.5.2. ((b) only)