

Section 7.3 Extra Problem

Write MATLAB functions to implement the Trapezoid, Simpson, and Gauss-4 rules. Apply them to the integrals:

a. $\int_0^1 e^{-x^2} dx = 0.74682413281242$

b. $\int_0^1 x^{2.5} dx = \frac{2}{7}$

c. $\int_{-4}^4 \frac{1}{1+x^2} dx = 2 * \arctan(4)$

d. $\int_0^{2\pi} \frac{1}{2+\cos(x)} dx = 3.62759872846843$

e. $\int_0^\pi e^x \cos(4x) dx = (e^\pi - 1)/17$

with N (number of strips, $h = (b-a)/N$) equal to 8 and 16. For each method applied to each integral, compute an experimental order of convergence.