

Homework Section 5.9: Approximate $\int_{-1}^2 e^{-x^2} dx$ with $n = 6$, using

a) The midpoint rule

i	\bar{x}_i	$f(\bar{x}_i)$

$$\int_{-1}^2 e^{-x^2} dx \approx \sum f(\bar{x}_i) \Delta x$$

b) Trapezoidal Rule

i	x_i	$f(x_i)$	M	$Mf(x_i)$

$$\int_{-1}^2 e^{-x^2} dx \approx \frac{\Delta x}{2} (f(x_0) + 2f(x_1) + 2f(x_2) + \dots + 2f(x_{n-1}) + f(x_n))$$

c) Simpson's Rule

i	x_i	$f(x_i)$	M	$Mf(x_i)$

$$\int_{-1}^2 e^{-x^2} dx \approx \frac{\Delta x}{3} (f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3) + \dots + 2f(x_{n-2}) + 4f(x_{n-1}) + f(x_n))$$