

Simpson Rule - Questions

1. Evaluate

$$\int_0^{\pi/2} e^{\sin x} dx$$

to an accuracy of $\varepsilon = 10^{-5}$ using the Composite Simpson's Rule.

2. Evaluate

$$\int_0^1 e^{-e^{-x}} dx$$

using the Composite Simpson's Rule with $N = 5$.

3. Evaluate

$$\int_0^1 \frac{\sin x}{x} dx$$

using the Composite Simpson's Rule with $N = 5$.

4. Determine

$$\int_{-1}^1 xe^x dx$$

accurate to $\varepsilon = 10^{-3}$, using the Composite Simpson's Rule.

5. Show that Simpson's Rule is exact for all polynomials of degree 3 or less.

6. Determine

$$\int_{-1}^1 \left(e^{-x^2} - \frac{1}{e} \right) dx$$

to an accuracy of $\varepsilon = 10^{-3}$, using the Composite Simpson's Rule.

- 7.