

EXERCISE SET 4.4

1. Use the Composite Trapezoidal rule with the indicated values of n to approximate the following integrals.

a. $\int_1^2 x \ln x \, dx, \quad n = 4$ b. $\int_{-2}^2 x^3 e^x \, dx, \quad n = 4$ c. $\int_0^2 \frac{2}{x^2 + 4} \, dx, \quad n = 6$

d. $\int_0^\pi x^2 \cos x \, dx, \quad n = 6$ e. $\int_0^2 e^{2x} \sin 3x \, dx, \quad n = 8$ f. $\int_1^3 \frac{x}{x^2 + 4} \, dx, \quad n = 8$

g. $\int_3^5 \frac{1}{\sqrt{x^2 - 4}} \, dx, \quad n = 8$ h. $\int_0^{3\pi/8} \tan x \, dx, \quad n = 8$

3. Use the Composite Simpson's rule to approximate the integrals in Exercise 1.

13. Determine the values of n and h required to approximate

$$\int_0^2 \frac{1}{x+4} \, dx$$

to within 10^{-5} and compute the approximation. Use

- a. Composite Trapezoidal rule. b. Composite Simpson's rule.
c. Composite Midpoint rule.