

BC CALCULUS PRACTICE 8.7
Name: _____ **Period** _____

Aisle _____

pg. 566; 1c, 3c, 5c, 15, 21, 25, 27

Optional: 13, 37

Show all necessary work neatly.

In exercises 1-6, use 10 subintervals to approximate the integral by the (c) Simpson's rule. In each case, find the exact value of the integral and approximate the absolute error. Express your answers to the nearest four decimal places. (Check your answer with prgm SIMPEQN)

1c.

$$\int_2^5 \sqrt{x-1} \, dx$$

$$3. \int_0^{\pi} \sin x \, dx$$

$$5. \int_1^3 e^{-x} \, dx$$

15c. Find the number of subintervals to ensure that the absolute error for the Simpson's rule approximation will be less than the given value.

$$\int_0^{\pi} \sin x \, dx; 10^{-3}$$

In exercises 21-26, use 10 subintervals to approximate the integral using Simpson's rule. Compare your answer to that produced by a calculating utility. Express your answers to at least four decimal places.

21.

$$\int_0^1 e^{-x^2} \, dx$$

25. $\int_0^2 \sin(x^2) dx$

In exercises 27-28, the exact value of the integral is π . Use 10 subintervals to approximate the integral by the Simpson's rule. Estimate the absolute error. Express your answers to at least four decimal places.

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

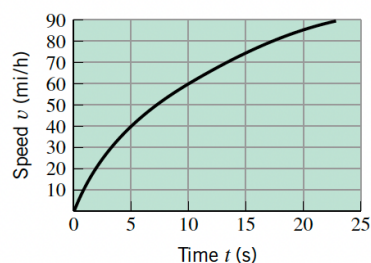
Optional: Find the number of subintervals to ensure that the absolute error for the Simpson's rule approximation will be less than the given value.

13.

$\int_0^3 \sqrt{x+1} dx; 5 \times 10^{-4}$

Optional:

37. A graph of the speed v versus time t for a test run of an Infiniti G20 automobile is shown in the accompanying figure. Estimate the speeds at $t = 0, 5, 10, 15,$ and 20 s from the graph, convert to ft/s using $1 \text{ mi/h} = 22/15 \text{ ft/s}$, and use these speeds to approximate the number of feet traveled during the first 20 s. Round your answer to the nearest foot. [Hint: Distance traveled $= \int_0^{20} v(t) dt$.] [Data from *Road and Track*, October 1990.]



(Check your answer with prgm SIMPDATA)