

5A Checkup

1. As a school project, Anna accompanies her mother on a trip to the grocery store and keeps a log of the car's speed at 10-second intervals. Explain how she can use the data to estimate the distance from her home to the store. What is the connection between this process and the definite integral?

2. Use the graph of the integrand and areas to evaluate the integral

$$\int_{-2}^4 \left(\frac{x}{2} + 3\right) dx$$

3. Express the limit as a definite integral

$$\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n \sqrt{4 - c_k^2} \Delta x_k, \text{ where } P \text{ is any partition of } [0,1]$$

4. Suppose that f and g are continuous functions and that

$$\int_1^2 f(x) dx = -4, \int_1^5 f(x) dx = 6, \int_1^5 g(x) dx = 8$$

Use properties of integrals to find each integral

(a) $\int_2^2 g(x) dx$

(b) $\int_5^1 g(x) dx$

(c) $\int_1^2 3f(x) dx$

(d) $\int_2^5 f(x) dx$

(e) $\int_1^5 [f(x) - g(x)] dx$

(f) $\int_1^5 [4f(x) - g(x)] dx$