

Evaluating Definite Integrals

1. Integrate the following definite integrals

(a) $\int_{1/2}^1 (4x^3 - 2x^2 - 7) \, dx$

(b) $\int_1^2 \frac{3}{t} \, dt$

(c) $\int_0^1 (v - \sqrt{v}) \, dv$

Applying Properties of Definite Integrals

2. Write the following as a single integral of the form $\int_a^b f(x) \, dx$

$$\int_{-2}^2 f(x) \, dx + \int_2^5 f(x) \, dx - \int_{-2}^{-1} f(x) \, dx$$

3. Given that

$$\int_1^4 f(x) \, dx = 6, \quad \int_4^6 f(x) \, dx = 3, \quad \int_1^4 g(x) \, dx = 4, \quad \int_2^4 g(x) \, dx = 1,$$

evaluate the following.

(a) $\int_1^4 (3f(x) - 2g(x)) \, dx$

(b) $\int_1^6 f(x) \, dx$

(c) $\int_1^2 f(x) \, dx - \int_2^4 (g(x) - f(x)) \, dx$

Area Under a Curve

4. Find the exact area of the region bounded by the function $f(x) = x^2 + 2$ on the interval $[0, 2]$ and the x -axis. Compare this result with the results you obtained in Written Homework 10, Problem 10.