Properties of the Definite Integral

Learning Objectives

- Use the properties of the definite integral

Use the properties of the definite integral

1. Use properties of even and odd functions to rewrite and simplify the integral $\int_{-2}^{2}(x^4 + 3x^3 - 7x^2 + 11x - 5)dx$ using properties of definite integrals.

2. Use the fact that $\int_{2}^{8} g(x)dx = 7, \int_{5}^{8} g(x)dx = 2$ to evaluate each of the following expressions.

   a. $\int_{2}^{5} g(x)\, dx$

b. $\int_8^2 g(x)dx$

c. $\int_8^5 2g(x)dx$

- $\int_b^a f(x)dx = -\int_a^b f(x)dx$
- $\int_a^b f(x)dx + \int_b^c f(x)dx = \int_a^c f(x)dx$
- $\int_{-a}^a f(x)dx = \begin{cases} 2\int_0^a f(x)dx & \text{if } f(x) \text{ is even} \\ 0, & \text{if } f(x) \text{ is odd} \end{cases}$

ANSWER KEY

1. $2 \int_0^2 (x^4 - 7x^2 - 5)dx$

2. a. 5; b. -7; c. -4