Section 5.2: The Definite Integral

Problem 1. Evaluate the following integrals by interpreting them in terms of areas of popular shapes.

(a) $\int_0^1 (2x - 1)dx,$ (b) $\int_0^1 |2x - 1|dx,$ (c) $\int_{-4}^4 (2x - \sqrt{16 - x^2})dx.$

Section 5.3: The Fundamental Theorem of Calculus

Problem 2. Evaluate the following integrals using the Fundamental Theorem of Calculus.

(a) $\int_0^1 \left(\frac{1}{x^2} + \frac{2}{x^3} \right) dx,$ (b) $\int_1^4 \frac{2 + x^2}{\sqrt{x}} dx,$ (c) $\int_0^3 (2\sin(x) - e^x) dx.$

Problem 3. What is wrong with the equation

$$\int_{-2}^1 x^{-4} dx = \left[\frac{x^{-3}}{-3} \right]_{-2}^1 = -\frac{3}{8} \quad ?$$