

Section 5.2 Practice Problems: Riemann Sums and Properties of Definite Integrals

1. Convert these Riemann sums into definite integrals $\left(\int_a^b f(x) dx\right)$

$$(a) A = \lim_{N \rightarrow \infty} \sum_{i=1}^N \frac{3}{N} \left(\left(4 + \frac{3}{N}i\right)^3 - 2 \left(4 + \frac{3}{N}i\right) + 1 \right)$$

$$(b) A = \lim_{N \rightarrow \infty} \sum_{i=1}^N \frac{4}{N} \left(\left(-6 + \frac{4}{N}i\right)^2 + 6 \left(-6 + \frac{4}{N}i\right) \right)$$

2. Consider a function $f(x)$ for which the following are true:

$$\int_1^3 f(x) dx = 2, \quad \int_3^4 f(x) dx = -1, \quad \int_4^6 f(x) dx = -6, \quad \int_6^9 f(x) dx = 4$$

Use the properties of integrals to compute these quantities:

$$(a) \int_1^4 f(x) dx$$

$$(b) \int_1^9 f(x) dx$$

$$(c) \int_3^6 f(x) dx$$

$$(d) \int_4^9 f(x) dx$$

$$(e) \int_6^4 f(x) dx$$

$$(f) \int_9^3 f(x) dx$$

$$(g) \int_4^4 f(x) dx$$