

Left and Right Riemann Sums

Learning Objectives

- Approximate the area under the curve using left-endpoint approximation
 - Approximate the area under the curve using right-endpoint approximation
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Approximate the area under the curve using left-endpoint approximation

1. Approximate the area under the curve $f(x) = 4 - x^2$ on the interval $[-2, 2]$ using left-endpoint approximations, and $n = 4$ rectangles.

Approximate the area under the curve using right-endpoint approximation

2. Approximate the area under the curve $f(x) = \frac{1}{2}x^2 + 1$ on the interval $[0,3]$ using right-endpoint approximations and $n = 6$ rectangles.

- Left-endpoint approximations: $\int_a^b f(x)dx \approx \sum_{i=1}^n f(x_{i-1})\Delta x$
- Right-endpoint approximations: $\int_a^b f(x)dx \approx \sum_{i=1}^n f(x_i)\Delta x$
- $\Delta x = \frac{b-a}{n}$

ANSWER KEY

1. 10

2. 8.6875