

5.1 Area and Estimating with Finite Sums

5.2 Sigma Notation and Limits of Finite Sums

Use a finite approximation to estimate the area under the graph of the given function on the stated interval as instructed.

1) $f(x) = \frac{1}{x}$ between $x = 1$ and $x = 6$ using a right sums with two rectangles of equal width. 1) _____

A) $\frac{95}{14}$

B) $\frac{15}{28}$

C) $\frac{95}{84}$

D) $\frac{45}{14}$

2) $f(x) = x^2$ between $x = 3$ and $x = 7$ using the "midpoint rule" with four rectangles of equal width. 2) _____

A) 126

B) 105

C) 86

D) 117

Find a formula for the Riemann sum obtained by dividing the interval $[a, b]$ into n equal subintervals and using the right-hand endpoint for each c_k . Then take a limit of these sums as $n \rightarrow \infty$ to calculate the area under the curve over $[a, b]$.

3) $f(x) = 5x + 6$ over the interval $[0, 3]$. 3) _____

A) $18 + \frac{45n^2 + 45n}{2n^2}$; Area = $\frac{81}{2}$

B) $18 + \frac{45n^2 + 45n}{2n^2}$; Area = $\frac{81}{5}$

C) $18 - \frac{45n^2 + 45n}{2n^2}$; Area = $-\frac{9}{2}$

D) $18 + \frac{42n^2 + 46n}{2n^2}$; Area = 39

4) $f(x) = 3x^2 + 4$ over the interval $[0, 3]$. 4) _____

A) $12 + \frac{162n^3 + 243n^2 + 81n}{6n^4}$; Area = 12

B) $12 + \frac{162n^3 + 243n^2 + 81n}{6n^3}$; Area = 27

C) $12 + \frac{162n^3 + 243n^2 + 81n}{6n^4}$; Area = 39

D) $12 + \frac{162n^3 + 243n^2 + 81n}{6n^3}$; Area = 39

Answer Key

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- 1) C
- 2) B
- 3) A
- 4) D