

Lecture Handout #22: Nov 15

Left and Right Riemann Sums

Estimate area under $f(t) = t^3$ from $t = 1$ to $t = 3$ with Riemann sums:

left end
 $a = \underline{\hspace{2cm}}$

right end
 $b = \underline{\hspace{2cm}}$

number of subdivisions
 $n = \underline{\hspace{2cm}}$

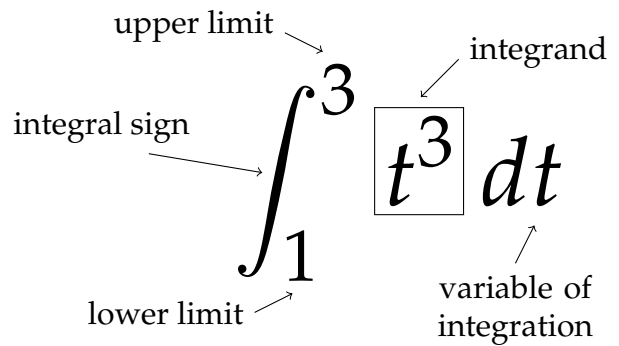
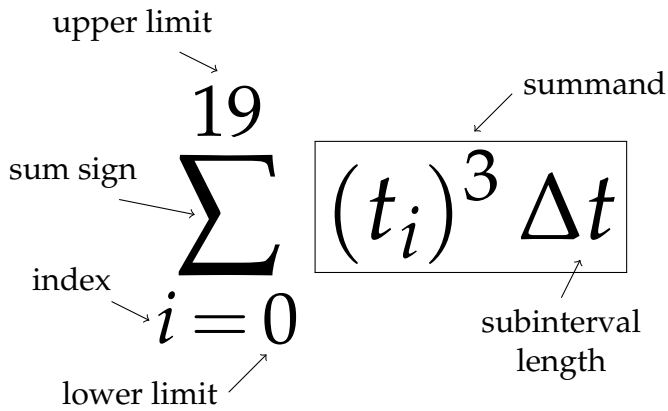
subinterval length
 $\Delta t = \underline{\hspace{2cm}}$



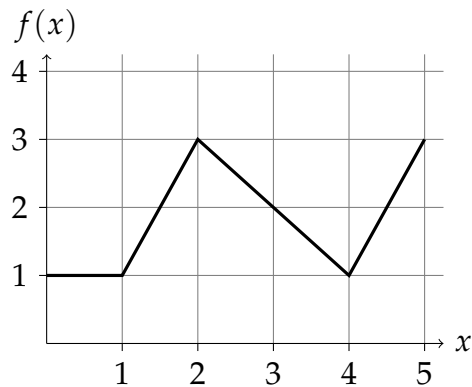
Left sum: $\sum_{i=0}^{\overline{\hspace{1cm}}} f(t_i) \Delta t = \sum_{i=0}^{\overline{\hspace{1cm}}} \underline{\hspace{2cm}} \approx \underline{\hspace{2cm}}$

Right sum: $\sum_{i=1}^{\overline{\hspace{1cm}}} f(t_i) \Delta t = \sum_{i=1}^{\overline{\hspace{1cm}}} \underline{\hspace{2cm}} \approx \underline{\hspace{2cm}}$

Notation: Riemann Sums and Definite Integrals



Evaluating Definite Integrals Graphically



$$\int_2^3 f(x) dx = \underline{\hspace{2cm} \frac{5}{2} \hspace{2cm}}$$

$$\int_0^2 f(x) dx = \underline{\hspace{2cm}}$$

$$\int_1^5 f(x) dx = \underline{\hspace{2cm}}$$