DEFINITE INTEGRAL

REGULAR PARTITION

REGULAR PARTITION

DEFINITION

Regular Partition of [a, b]

$$egin{aligned} \Delta x &= rac{b-a}{n} \ x_i &= a + i \Delta x \ I_i &= [x_{i-1}, x_i] \end{aligned}$$

EXAMPLE

Let $\left[a,b\right]=\left[2,5\right]$ and let n=3

APPROXIMATING SUMS

MIN/MAX

DEFINITION

$$m_i = \min\{f(x): x \in I_i\} \ M_i = \max\{f(x): x \in I_i\}$$

EXAMPLE

$$f(x)=x+4$$

$$x \in [2, 5]$$

$$n = 3$$

MIN/MAX SUM

DEFINITION

$$m_f(n) = (m_1 + \cdots + m_n) \Delta x \ M_f(n) = (M_1 + \cdots + M_n) \Delta x$$

EXAMPLE

$$f(x)=x+4$$

$$x \in [2, 5]$$

$$n = 3$$

DEFINITE INTEGRAL

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DEFINITION

For f continuous, the definite integral is

$$\int_a^b f(x) dx = \lim_{n o \infty} m_f(n) = \lim_{n o \infty} M_f(n)$$

EXAMPLE

$$\int_0^1 x dx = rac{1}{2}$$