Somatórios

$$\sum_{k=1}^{n} c_k = c_1 + c_2 + c_3 + \ldots + c_n$$

$$\sum_{k=1}^{n} c = c + c + c + c + \ldots + c = nc$$

$$\sum_{k=1}^{n} (a_k \pm b_k) = \sum_{k=1}^{n} a_k \pm \sum_{k=1}^{n} b_k$$

$$\sum_{k=1}^{n} ca_k = c\sum_{k=1}^{n} a_k$$

$$\sum_{k=1}^{n} k = \frac{n(n+1)}{2}, \ 1+2+3+4+\ldots.+98+99+100$$

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$

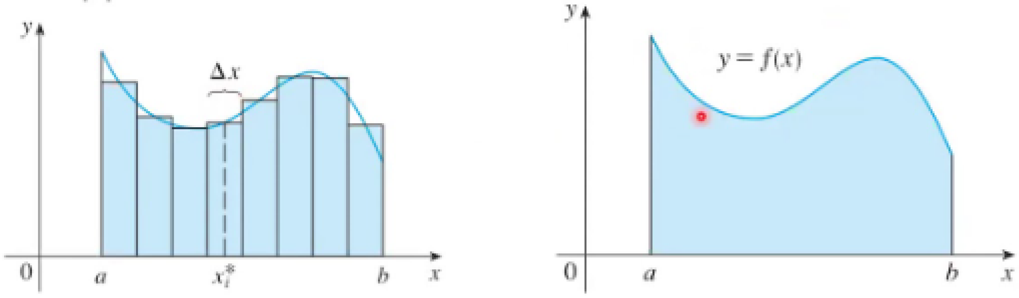
$$\sum_{k=1}^{n} k^3 = \left[\frac{n(n+1)}{2}\right]^2$$

$$\sum_{k=1}^{n} \left[F(k) - F(k-1)\right] = F(1) - F(0) + F(2) - F(1) + \ldots + F(n) - F(n-1) = F(n) - F(0)$$

INTEGRAL DEFINIDA

$$\int_a^b f(x)\,dx = \int_a^b f(t)\,dt = \int_a^b f(r)\,dr$$

$$\sum_{i=1}^{n} f(x_i^*)\,\Delta x \qquad\qquad \int_a^b f(x)\,dx$$



$$\Delta x = \frac{b-a}{n}$$

$$x_k = a + k\Delta x$$

$$f(x_k)$$

$$A_k = f(x_k)\Delta x_k$$

$$A_p = \sum_{k=1}^{n} A_k$$

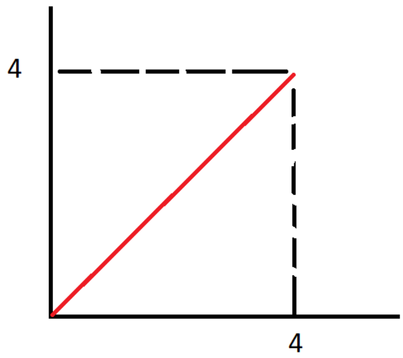
$$A = \lim_{n\to\infty}\left[\sum_{k=1}^{n} A_k\right] = \lim_{n\to\infty} A_p$$

Exemplo: Calcule a área limita por:

$$f(x) = 3, \quad x = 0 \ \ até \ \ x = 2$$
$$\Delta x = 2/n$$
$$x_k = 2k/n$$
$$f(x_k) = 3$$
$$A_k = 6/n$$
$$\sum_{k=1}^{n} 6/n = \frac{6}{n} + \frac{6}{n} + \frac{6}{n} + \ldots + \frac{6}{n} = n\frac{6}{n} = 6$$
$$A = \lim_{n\to\infty}(6) = 6$$

Exemplo: Calcule a área limita por:

$$f(x) = x, \quad x = 0 \ \ até \ \ x = 4$$
$$\Delta x = 4/n$$
$$x_k = 4k/n$$
$$f(x_k) = 4k/n$$
$$A_k = \frac{4k}{n}\frac{4}{n} = \frac{16k}{n^2}$$
$$\sum_{k=1}^{n} \frac{16k}{n^2} = \frac{16}{n^2}\sum_{k=1}^{n} k = \frac{16}{n^2}\frac{n(n+1)}{2}$$
$$A = \lim_{n\to\infty}\frac{8}{n^2}(n^2 + n)$$
$$A = \lim_{n\to\infty}\left[8 + \frac{8}{n}\right] = 8$$



Exemplo: Calcule a área limita por:

$$f(x) = x^2, \quad x = 0 \ \ até \ \ x = 3$$
$$\int_0^3 x^2 dx = \left.\frac{x^3}{3}\right|_{x=0}^{x=3} = \frac{3^3}{3} - \frac{0^3}{3} = 9$$

$$f(x) = x^2, \quad x = 1 \ \ até \ \ x = 4$$
$$\int_1^4 x^2 dx = \left.\frac{x^3}{3}\right|_{x=1}^{x=4} = \frac{4^3}{3} - \frac{1^3}{3} = 21$$