Calculus Notation

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1 domain and range

The function $f(x) = (x - 3) + \frac{1}{2}$ has domain $\mathrm{D}_f : (-\infty, \infty)$ and range $\mathrm{R}_f : \left[\frac{1}{2}, \infty\right)$

2 limit

$\lim_{x \to a}$

$\lim_{x \to a^+}$

$\lim_{x \to a} \frac{f(x) - f(a)}{x - a} = f'(a)$

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3 Integral

3.1 Indefinite integral

$\int \sin x \, \mathrm{dx} = -\cos x + C$

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3.2 Definite integral

$\int_a^b$

$\int\limits_a^b$

$\int_a^b$

$\int\limits_a^b$

$\int\limits_{2a}^{2b}$

$$\int\limits_a^b x^2 \, dx = \left[\frac{x^3}{3}\right]_a^b = \frac{b^3}{3} - \frac{a^3}{3}$$

3.3 Summation

$$\sum_{n=1}^{\infty} ar^n = a + ar + ar^2 + \cdot + ar^n$$

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$$\int_a^b f(x)\,dx = \lim_{x\to\infty} \sum_{k=1}^{n} f(x_k) \cdot \Delta x$$

4 Vector

$\vec{v} = v_1\vec{i} + v_2\vec{j} = \langle v_1, v_2 \rangle$