数学公式简单示例

1. 基本公式:

$$f(x) = 2\sigma + 3$$

2. 积分公式:

$$\int_a^b f(x)\,dx.$$

3. 上下标:

$$\sum_{i=1}^{n} a_i = 0$$

$$f(x) = x^{x^x}$$

4. 添加公式标号:

$$\sigma_z = \sqrt{\Sigma(\Delta_z - \langle\Delta_z\rangle)^2/(N-1)} \tag{1}$$

5. 取消公式标号:

$$\sigma_z = \sqrt{\Sigma(\Delta_z - \langle\Delta_z\rangle)^2/(N-1)}$$

6. 在公式中插入文本:

$$\text{对任意的 } x > 0, \text{有} f(x) > 0.$$

7. 分式及开方:

$$y = \frac{m}{n}$$

$$y = \sqrt{\sigma}$$

$$y = \sqrt[n]{\lambda}$$

8. 省略号:

$$f(x_1, x_x, \ldots, x_n) = x_1^2 + x_2^2 + \cdots + x_n^2$$

9、括号和分隔符:

$$f(x,y,z) = 3y^2 z \left(3 + \frac{7x+5}{1+y^2}\right).$$

$$\left.\frac{du}{dx}\right|_{x=0} = 2x$$

10. 多行对齐公式:

$$\begin{aligned} \cos 2\theta &= \cos^2\theta - \sin^2\theta \\ &= 2\cos^2\theta - 1. \end{aligned}$$

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11. 矩阵:

The *characteristic polynomial* $\chi(\lambda)$ of the $3 \times 3$ matrix

$$\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$$

is given by the formula

$$\chi(\lambda) = \begin{vmatrix} \lambda - a & -b & -c \\ -d & \lambda - e & -f \\ -g & -h & \lambda - i \end{vmatrix}.$$

12、导数、极限、求和、积分 (Derivatives, Limits, Sums and Integrals):

$$\frac{du}{dt} and \frac{d^2u}{dx^2}$$

$$\frac{\partial u}{\partial t} = h^2 \left( \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \right)$$

$$\lim_{x \to +\infty}, \inf_{x > s} and \sup_K$$

$$\lim_{x \to 0} \frac{3x^2 + 7x^3}{x^2 + 5x^4} = 3.$$

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

$$\int_a^b f(x)\, dx.$$

$$\int_0^{+\infty} x^n e^{-x}\, dx = n!.$$

$$\int \cos\theta\, d\theta = \sin\theta.$$

$$\int_{x^2+y^2 \leq R^2} f(x,y)\, dx\, dy = \int_{\theta=0}^{2\pi} \int_{r=0}^{R} f(r\cos\theta, r\sin\theta) r\, dr\, d\theta.$$

$$\int_0^R \frac{2x\, dx}{1+x^2} = \log(1+R^2).$$

One would typeset this in LaTeX by typing In non-relativistic wave mechanics, the wave function $\psi(\mathbf{r}, t)$ of a particle satisfies the *Schrödinger Wave Equation*

$$i\hbar\frac{\partial\psi}{\partial t} = \frac{-\hbar^2}{2m}\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} + \frac{\partial^2}{\partial z^2}\right)\psi + V\psi.$$

It is customary to normalize the wave equation by demanding that

$$\iiint_{\mathbf{R}^3} \left|\psi(\mathbf{r}, 0)\right|^2 \, dx\, dy\, dz = 1.$$

A simple calculation using the Schrödinger wave equation shows that

$$\frac{d}{dt}\iiint_{\mathbf{R}^3} \left|\psi(\mathbf{r}, t)\right|^2 \, dx\, dy\, dz = 0,$$

and hence

$$\iiint_{\mathbf{R}^3} \left|\psi(\mathbf{r}, t)\right|^2 \, dx\, dy\, dz = 1$$

for all times $t$. If we normalize the wave function in this way then, for any (measurable) subset $V$ of $\mathbf{R}^3$ and time $t$,

$$\iiint_{V} \left|\psi(\mathbf{r}, t)\right|^2 \, dx\, dy\, dz$$

represents the probability that the particle is to be found within the region $V$ at time $t$.