LaTeX (Matematik)

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1 Getting Started

LaTeX (Matematik) Today I am learning LaTeX. LaTeX is a great program for writing math. I can write in line math such as $a^2 + b^2 = c^2$. I can also give equations their own space:

$$\gamma^2 + \theta^2 = \omega^2 \tag{1}$$

" Maxwell's equations" are named for James Clark Maxwell and are as follow:

$$\begin{align}
\vec{\nabla} \cdot \vec{E} &= \frac{\rho}{\varepsilon_0} && \text{Gauss's Law} \tag{2}\\
\vec{\nabla} \cdot \vec{B} &= 0 && \text{Gauss's Law for Magnetism} \tag{3}\\
\vec{\nabla} \times \vec{E} &= -\frac{\partial \vec{B}}{\partial t} && \text{Faraday's Law of Induction} \tag{4}\\
\vec{\nabla} \times \vec{B} &= \mu_0 \left(\varepsilon_0 \frac{\partial \vec{E}}{\partial t} + \vec{J} \right) && \text{Ampere's Circuital Law} \tag{5}
\end{align}$$

Denklem 2, 3, 4 and 5 are some of the most important in Physics.

2 What about Matrix Equations?

$$\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix} \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_n \end{bmatrix} = \begin{matrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{matrix}$$

$$\iiint\limits_V f(x,y,z)\,dV = F$$

$$\frac{dx}{dy} = x' = \lim_{h\to 0}\frac{f(x+h)-f(x)}{h} = 0$$

$$|x| = \begin{cases} -x & if\ x < 0 \text{ ise} \\ x & if\ x \geq 0 \text{ ise} \end{cases}$$

$$F(x) = A_0 + \sum_{n=1}^{N}\left[A_n\cos\left(\frac{2\pi n}{P}\right) + B_n\sin\left(\frac{2\pi n}{P}\right)\right]$$

$$\sum_{n=1}\frac{1}{n^s} = \prod_P\frac{1}{1-\frac{1}{P^n}}$$

$$m\ddot{x} + c\dot{x} + kx = F_0\sin(2\pi ft)$$

$$\begin{aligned} f(x) &= x^2 + 3x + 5x^2 + 8 + 6x \\ &= 6\text{x}^2 + 9x + 8 \\ &= \text{x(6x+9)+8} \end{aligned}$$

$$X = \frac{F_0}{k}\frac{1}{\sqrt{(1-r^2)^2 + (2\zeta r^2)}}$$

$$G_{\mu\upsilon} \equiv R_{\mu\upsilon} - \frac{1}{2}Rg_{\mu\upsilon} = \frac{8\pi G}{c^4}T_{\mu\upsilon}$$

$$6CO_2 + 6H_2O \rightarrow C_6H_12O_6 + 6O_2$$

$$SO_4{}^{2-} + Ba^{2+} \rightarrow BaSO_4$$

$$\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix} \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_n \end{bmatrix} = \begin{matrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{matrix}$$

$$\frac{\partial_u}{\partial_t} + (u.\nabla)u - \upsilon\nabla^2(u) = -\nabla h$$

$$\alpha A\beta B\gamma\Gamma\delta\Delta\pi\Pi\omega\Omega$$