

Medium

$$1_A=\begin{cases}1& \text{if } x\in A\\0& \text{if } x\notin A\end{cases}$$

$$n\uparrow\overbrace{\dots\uparrow}^n n=n\rightarrow n\rightarrow n$$

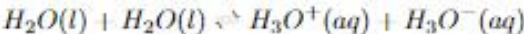
In the following, note the spacing between the and the 1<sup>1</sup>, 2, and 3.

$$1\uparrow 1=1^1=1$$

$$2\uparrow 2=2^2=4$$

$$3\uparrow\uparrow\uparrow 3=3^{3^3}=3\uparrow\uparrow 3\uparrow\uparrow 3=\underbrace{3^{3^{3^{\cdot^{\cdot^{\cdot^3}}}}}}_{3^{3^3}\text{ threes}}$$

$$\frac{d}{dx}f(x)=\lim_{\Delta x\rightarrow 0}\frac{f(x+\Delta x)-f(x)}{\Delta x}$$



$$\Gamma(n+1)\stackrel{\text{def}}{=}\int_0^\infty e^{-t}t^n\,dt\;\gcd(n,m,\text{mod}\;n);\;\;x\equiv y\mod c;\;\;x\equiv y\pmod d$$

In the following, note the bold symbols.

$$\nabla\cdot\mathbf{E}=\frac{\rho}{\epsilon_0}$$

$$\nabla\cdot\mathbf{B}=0$$

$$\nabla\times\mathbf{E}=-\frac{\partial\mathbf{B}}{\partial t}$$

$$\nabla\cdot\mathbf{E}=\mu_0\mathbf{J}+\mu_0\epsilon_0\frac{\partial\mathbf{E}}{\partial t}$$

$$\oint\limits_{\partial V}\mathbf{E}\cdot d\mathbf{A}=\frac{Q(V)}{\epsilon_0}$$

$$\oint\limits_{\partial V}\mathbf{B}\cdot d\mathbf{A}=0$$

$$\oint_{\partial S}\mathbf{E}\cdot d\mathbf{l}=-\frac{\partial\Phi_{E,S}}{\partial t}$$

$$\oint_{\partial S}\mathbf{B}\cdot d\mathbf{l}=\mu_0I_S+\mu_0\epsilon_0\frac{\partial\Phi_{E,S}}{\partial t}$$

$$\begin{aligned}\rho_\theta &= \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix} \\ &= \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix} \cdot \begin{vmatrix} 1 & 0 & \cdots & 0 \\ 0 & * & \cdots & * \\ \vdots & \vdots & \ddots & \vdots \\ 0 & * & \cdots & * \end{vmatrix} \\ &= \begin{vmatrix} 1 & 0 & \cdots & 0 \\ 0 & * & \cdots & * \\ \vdots & \vdots & \ddots & \vdots \\ 0 & * & \cdots & * \end{vmatrix}\end{aligned}$$

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N p_i (x_i - \bar{x})^2} = \sqrt{\frac{\sum_{i=1}^N p_i (x_i - \bar{x})^2}{N}}$$

$$\phi(n) = n \cdot \prod_{\substack{p|n \\ p \text{ prime}}} \left(1 - \frac{1}{p}\right)$$

$${}^4_{12}C_2^{5+}$$

$${}^{14}_2C_2^{5+}$$

$${}^4_{12}C_2^{5+}$$

$${}^{14}C_2^{5+}$$

$${}_2C_2^{5+}$$

$$Q\cong\left\{\frac{a}{b}\middle|a,b\in Z\quad b\neq0\right\}/\sim$$

$$\frac{a}{b}\sim\frac{c}{d}\Longleftrightarrow ad-bc=0$$

$$1\uparrow 1 = {}^11 = 1$$

$$2\uparrow\uparrow 2 = {}^22 = 4$$

$$3\uparrow\uparrow\uparrow 3 = {}^33 3 = 3\uparrow\uparrow 3\uparrow\uparrow 3 = 3^{3^{3^{3^{3^{\dots^3}}}}}$$