

Formler för Fysik för Ingenjörer I del 1b

$$y = f(x \pm vt)$$

$$v = \sqrt{\frac{T}{\square}}$$

$$y = A \sin(kx - \omega t + \phi)$$

$$v = \frac{\omega}{T}$$

$$k = \frac{2\pi}{\lambda}$$

$$\lambda = \frac{2\pi}{T}$$

$$f = \frac{1}{T}$$

$$\lambda = \frac{1}{2} \pi \lambda^2 A^2 v$$

$$\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2} \frac{\partial^2 y}{\partial t^2}$$

$$v = \sqrt{\frac{B}{\lambda}}$$

$$s(x, t) = s_{\max} \cos(kx - \omega t)$$

$$\lambda P = \lambda P_{\max} \sin(kx - \omega t)$$

$$\lambda P_{\max} = \lambda v \lambda s_{\max}$$

$$I = \frac{\lambda P_{\max}^2}{2\lambda v}$$

$$\lambda = 10 \log \left| \frac{I}{I_0} \right|$$

$$\lambda(r, t) = \frac{s_0}{r} \sin(kr - \omega t)$$

$$\lambda r = \frac{\omega}{2\pi} \lambda$$

$$y = 2A \sin kx \cos \omega t$$

$$\lambda = \frac{2L}{n}$$

$$\lambda_r = \lambda_i$$

$$n = \frac{c}{v}$$

$$n_1 \sin \lambda_1 = n_2 \sin \lambda_2$$

$$\sin \lambda_c = \frac{n_2}{n_1}$$

$$d \sin \lambda = m \lambda$$

$$d \sin \lambda = (m + \frac{1}{2}) \lambda$$

$$I = I_{\max} \cos^2 \left| \frac{\lambda}{\lambda} \frac{d \sin \lambda}{\lambda} \right|^2$$

$$\sin \lambda = m \frac{\lambda}{a}$$

$$I = I_{\max} \left| \frac{\sin(\lambda a \sin \lambda / \lambda)}{\lambda a \sin \lambda / \lambda} \right|^2$$

$$\lambda_{\min} = \frac{\lambda}{a}$$

$$\lambda_{\min} = 1.22 \frac{\lambda}{D}$$

$$d \sin \lambda = m \lambda$$

$$\lambda = \sqrt{1 - \frac{v^2}{c^2}}$$

$$\lambda t = \lambda t_p$$

$$L = \frac{L_p}{\lambda}$$

$$x' = \lambda(x - vt)$$

$$y' = y, z' = z$$

$$t' = \lambda(t - \frac{v}{c^2} x)$$

$$u_x = \frac{u_x \lambda v}{1 - \frac{u_x v}{c^2}}$$

$$\vec{p} = \lambda m \vec{u}$$

$$\vec{F} = \frac{d\vec{p}}{dt}$$

$$E = \lambda m c^2 = K + mc^2$$

$$I(\Box,T)=\frac{2\Box\hbar c^2}{\Box(e^{h\Box\hbar k_BT}\Box 1)}$$

$$E = hf$$

$$K_{\max} = hf \Box \Box$$

$$\frac{1}{\Box} = R(\frac{1}{n_f} \Box \frac{1}{n_i})$$

$$E_n=\Box \frac{k_e e^2}{2a_0} \Box \frac{1}{n^2} \Box$$

$$\Box = \frac{h}{p}$$

$$\Box x \Box p_x \geq \frac{\hbar}{2}$$

$$\Box E \Box t \geq \frac{\hbar}{2}$$

$$P(x)dx=|\Box|^2dx$$

$$\Box \Box^2 dx = 1$$

$$P_{ab}=\Box \Box^2 dx$$

$$\Box(x)=A\sin\Box \frac{n\Box x}{L}\Box$$

$$E_n=\Box \frac{h^2}{8mL^2} \Box n^2$$

$$\frac{d^2\Box}{dx^2}=\Box \frac{2m}{\hbar}(E\Box U)\Box$$

$$\Box_{1s}(r)=\frac{1}{\sqrt{\Box a_0^3}}e^{\Box r/a_0}$$

$$P_{1s}(r)=\Box \frac{4r^2}{a_0^3}\Box e^{\Box 2r/a_0}$$

$$L=\sqrt{l(l+1)}\hbar$$

$$L_z=m_i\hbar$$

$$S=\sqrt{s(s+1)}\hbar$$

$$S_z=m_s\hbar=\pm\frac{1}{2}\hbar$$

$$f(E)=\frac{1}{e^{(E\Box E_F)\Box k_BT}+1}$$

$$N(E)dE=C\frac{E^{\gamma_2}dE}{e^{(E\Box E_F)\Box k_BT}+1}$$

$$a_0=0.529\times 10^{10}\, m$$

$$k_B=1.38\times 10^{23}\, J/K$$

$$k_e=8.988\times 10^9 Nm^2/C^2$$

$$m_e=9.109\times 10^{31} kg$$

$$e=1.602\times 10^{19} C$$

$$h=6.63\times 10^{34} Js$$

$$\hbar=h/2\Box$$

$$R=1.097\times 10^7 m^\Box$$

$$c=2.9979\times 10^8 m/s$$

$$I_0=1.00\times 10^{12} W/m^2$$

$$\sin a + \sin b = 2 \cos \Box \frac{a \Box b}{2} \Box \sin \Box \frac{a+b}{2} \Box$$

$$2\sin a \cos b = \cos(a+b) \Box \cos(a \Box b)$$