$P = I^2R$

$E = Pt$

$\boldsymbol{F} = m\boldsymbol{a}$

$1/R_{eq} = 1/R_1 + 1/R_2$

$R_{eq} = R_1 + R_2$

$$v = \sqrt{\frac{F}{m/L}}$$

$c/\lambda = f$

$$E_n = -\frac{13.6Z^2}{n^2}eV$$

$n\lambda = d\sin\theta$

$$b = (10)\log\frac{I}{I_0}$$

$\tau = L/R$

$$I = \frac{P}{A}$$

$$I(t) = \frac{V}{R}e^{-\frac{t}{RC}}$$

$$V(t) = V_0[1 - e^{-\frac{t}{RC}}]$$

$\tau = RC$

$$I(t) = \frac{V}{R}[1 - e^{-\frac{t}{t}}]$$

$$V(t) = V_0[1 - e^{-\frac{t}{t}}]$$

$$\sin q = 1.22\frac{l}{D}$$

$1/d_o + 1/d_i = 1/f$

$m = -d_i/d_o$

$m = h_i/h_o$

$$f_n = n\frac{v}{2l}$$

$$f_n = n\frac{v}{4l} \quad n = 1, 2, 3, ...$$

$X_L = 2\pi fL$

$V = IR$

$I_mZ = V_mI_mX_C = V_C$

$I_mX_L = V_L$

$CV = Q$

$X_C = 1/2\pi fC$

$E = hf$

$$m_e = 9.11\times10^{-31}kg$$

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

$v = \lambda f$

$c = 3 \times 10^8$ m/s

$h = 6.63 \times 10^{-34}$ J·s

$h = 4.14 \times 10^{-15}$ eV·s

$1 \text{ eV} = 1.602 \times 10^{-19}$ J

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

$$F = k\frac{q_1q_2}{r^2}$$

$$\tan f = \frac{X_L - X_C}{R}$$

$$f_o = \left(2p\sqrt{LC}\right)^{-1}$$

$EA = q/\varepsilon_0$

$$B = \frac{m_0I}{2pr}$$

$$B = N\frac{m_0I}{2R}$$

$B = nm_0 I$

$c = \frac{1}{\sqrt{e_0 m_0}}$

$\mathrm{k} = 9.0 \times 10^9 \frac{\mathrm{N \cdot m^2}}{\mathrm{C^2}}$

$e_0 = 8.85 \times 10^{-12} \frac{C^2}{N \cdot m^2}$

$S = ce_0 E^2$

$S = \frac{c}{m_0} B^2$

$\vec{F} = k \frac{q_1 q_2}{r^2} \hat{r}$

$F = l \frac{m_0 II'}{2pr}$

$\vec{E} = \frac{\vec{F}}{q}$

$F = IBl \sin q$

$V = k \frac{q}{r}$

$CV = Q$

$\varepsilon = -\mathrm{N} \frac{\Delta \Phi_\mathrm{B}}{\Delta \mathrm{t}}$

$e = vBl \sin q$

$\ln e^x = x$

$n_1 \sin\theta_1 = n_2 \sin\theta_2$

$\sin q = m \frac{l}{d}$

$P = IV = I^2 R$

$v_R = V_R \sin wt$

$2t = m\lambda_{film}$

$C = e_0 \frac{A}{d}$

$\Delta t = \Delta t_0 / \gamma$

$\Delta L = \Delta L_0 \gamma$

$U = \frac{1}{2} CV^2 = \frac{1}{2} e_0 E^2 Ad$

$\sum B_{\text{parallel}} \Delta \ell = m_0 I_{\text{enc}} = m_0 \varepsilon_0 \frac{\Delta \Phi_\mathrm{E}}{\Delta \mathrm{t}}$

$v = v_0 + at$

$w = w_0 + at$

$v^2 = v_0^2 + 2a(x - x_0)$

$w^2 = w_0^2 + 2a(q - q_0)$

$PV = nRT$

$x - x_0 = v_0 t + \frac{1}{2} a t^2$

$q - q_0 = w_0 t + \frac{1}{2} a t^2$

$\mathrm{B} = 10 \log \frac{I}{I_0}$

$\cos q = \frac{adjacent}{hyp}$

$w = 2pf = \frac{v}{R}$

$u = \frac{u' + v}{1 + \frac{u'v}{c^2}}$

$\sin q = \frac{opposite}{hyp}$

$v = \omega A$

$E = mc^2$

$\tan q = \frac{opposite}{adjacent}$

$f = \frac{1}{T} = \frac{1}{2p} \sqrt{\frac{k}{m}}$

$\lambda = h/p$

$\boldsymbol{F}_f = \mu \boldsymbol{N}$

$\Delta x \Delta p \geq \frac{h}{2p}$

$\boldsymbol{G} = \mathrm{I}\boldsymbol{a}$

Γ = force $\times$ distance

$\Delta E \Delta t \geq \frac{h}{2p}$

$R = \frac{v_0^{\,2} \sin 2q}{g}$

$H = A\frac{(T_2 - T_1)}{\sum_i R_i}$

$P = sAeT^4$

$W_{nc} = E_f - E_i$

$Q = mL$

$\Delta U = Q - W$

K.E. = ½mv^2 = qΔV

K.E. = ½Iω^2

$dW = PdV$

P.E.$_{(grav)}$ = mgh

P.E.$_{(elastic)}$ = ½kx^2

$Q = mc\Delta t$

W = F $\times$ s = ΔKE = ΔPE

$P_{gauge} = \rho gh$

$W = \int_{v_i}^{v_f} PdV$

$a_c = v^2/r$

$e = \frac{W}{Q_h} = \frac{Q_h - Q_c}{Q_h} = 1 - \frac{Q_c}{Q_h}$

$P_{absolute} = P_{atm} + \rho gh$

ΔKE + ΔPE = 0

$P_1 + ½\rho v_1^{\,2} + \rho g h_1 = P_2 + ½\rho v_2^{\,2} + \rho g h_2$

$\boldsymbol{p} = \mathrm{m}\boldsymbol{v}$

$A_1 v_1 = A_2 v_2$

$e = 1 - \frac{T_c}{T_h}$

$\boldsymbol{L} = \mathrm{I}\boldsymbol{w}$

B.F. = $\rho_f g V$

$COP_{HP} = \frac{Q_h}{W}$

$a_t = \Delta v/\Delta t = r\alpha$

$\rho = \frac{m}{v}$

$\Delta S = \int_i^f \frac{dQ_r}{T}$

deg $\times$ $2\pi/360^0$ = rad

$\frac{1}{f} = \frac{(n_2 - n_1)}{n_1}\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$