

Jöfnur

EÐL103

Hreyfifræði

$$a = \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1}$$

$$s = v_j \cdot t$$

$$\bar{v} = \frac{\Delta s}{\Delta t}$$

$$\bar{v} = \frac{v_o + v}{2}$$

$$s = v_o t + \frac{1}{2} a t^2$$

$$s = v_o t + \frac{1}{2} g t^2$$

$$2as = v^2 - v_o^2$$

$$2gs = v^2 - v_o^2$$

$$s = \frac{v_o + v}{2} \cdot t$$

$$v = v_o + at$$

$$v = v_o + gt$$

Kraftfræði

$$F = m \cdot a$$

$$F_g = mg$$

$$F_{\text{min}} = \mu F_{\text{pver}}$$

$$F = -k \cdot x$$

$$F_{\text{pver}} = mg \cos \theta$$

$$F_{\text{samsíða}} = mg \sin \theta$$

$$\mu = \tan \theta$$

Vinna og orka

$$W = F \cdot \Delta s \cdot \cos \theta$$

$$P = \frac{W}{\Delta t}$$

$$P = F_{\text{sams}} \cdot v$$

$$K = \frac{1}{2} m v^2$$

$$U = mgh$$

Framhald vinna og orka

$$E = K + U$$

$$W = \Delta E$$

$$U_{sp} = \frac{1}{2} kx^2$$

$$F \cdot s = \frac{1}{2} m v_2^2 - \frac{1}{2} m v_1^2$$

$$\tau = F_{\text{pver}} \cdot a$$

$$F_1 \cdot a_1 = F_2 \cdot a_2$$

Þrýstingur:

$$p = \frac{F_{\text{pver}}}{A}$$

$$p = \rho gh + p_o$$

$$760 \text{ torr} = 1,013 \cdot 10^5 \text{ Pa} \equiv 1,013 \text{ B} \equiv 1013 \text{ mB} \equiv 1 \text{ atm}$$

Varmafræði:

$$C = \frac{Q}{T}$$

$$c = \frac{Q}{m \Delta T}$$

$$l_{\text{hræostu}} = \frac{Q}{m}$$

$$l_{\text{gufu}} = \frac{Q}{m}$$

Atlag og skriðþungi:

$$p = mv$$

$$K = \frac{p^2}{2m}$$

$$F = \frac{\Delta p}{\Delta t}$$

$$I_{\text{heild}} = \Delta p$$

$$v_{B2} - v_{A2} = -(v_{B1} - v_{A1})$$

Ljós

$$\frac{\sin \alpha_1}{\sin \alpha_2} = \frac{\lambda_1}{\lambda_2}$$

$$\frac{v_1}{v_2} = \frac{\lambda_1}{\lambda_2}$$

$$\frac{\sin \theta_1}{\sin \theta_2} = \frac{c_1}{c_2}$$

$$n_{\text{efni}} = \frac{c_{\text{tóm}}}{c_{\text{efni}}}$$

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

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$$

$$\text{stækkun} = \frac{b}{a}$$

Jöfnur

EDL203

Varmafræði

$$C = \frac{Q}{T} \text{ (varmrýmd)}$$

$$c = \frac{Q}{m\Delta T} \text{ (eðlisvarmi)}$$

$$l_{\text{bræðslu}} = \frac{Q}{m}$$

$$l_{\text{gufu}} = \frac{Q}{m}$$

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

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

$$f_n = \frac{v}{\lambda_n} = n \cdot \frac{v}{2L} \Rightarrow f_n = n f_{\text{grunn}}$$

$$\lambda_n = \frac{4L}{(2n-1)}$$

Gaslögmálið

$$T_K = T_c + 273,16$$

$$\frac{T}{273,16} = \frac{p}{p_3}$$

$$\frac{1}{2}mv^2 = \frac{3}{2}kT; k = 1,38 \cdot 10^{-23} \text{ J/K}$$

$$pV = nRT; R = 8,314 \text{ J/(mól} \cdot \text{K)}$$

$$p_1V_1 = p_2V_2$$

$$\frac{p_1}{T_1} = \frac{p_2}{T_2}$$

Bylgjufræði:

$$|\overline{S_1 P} - \overline{S_2 P}| = (n + \frac{1}{2})\lambda$$

$$|\overline{S_1 P} - \overline{S_2 P}| = n\lambda$$

$$\sin \theta_n = \frac{n\lambda}{d}$$

$$v = f \cdot \lambda$$

$$f_n = \frac{(2n-1)v}{4L} = (2n-1)f_{\text{grunn}}$$

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

$$I = \frac{P_{\text{vert}}}{A} = \frac{P}{4\pi r^2}$$

$$L = 10 \cdot \log \frac{I}{I_0}; I_0 = 10^{-12} \text{ W/m}^2$$

Skákast:

$$v_x = v_o \cos \theta$$

$$v_y = v_o \sin \theta$$

$$y = \frac{v_{oy}}{v_x} x + \frac{g}{2v_x^2} x^2$$

$$x = x_o + v_x t$$

$$y = y_o + v_{oy} t + \frac{1}{2} g t^2$$

Hringhreyfing:

$$\omega = \frac{d\theta}{dt}$$

$$\omega = \frac{2\pi}{T} = 2\pi f$$

$$v = r\omega$$

$$a = r\omega^2$$

$$a_{m\delta} = \frac{v^2}{r}$$

$$a_{m\delta} = 4\pi^2 \frac{r}{T^2}$$

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

$$F_{m\delta} = m \frac{v^2}{r}$$

$$T = 2\pi \sqrt{\frac{l \cos \theta}{g}}$$

Einföld sveifluhreyfing:

$$F = -k \cdot x$$

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

$$\frac{d^2 x}{dt^2} = -\frac{k}{m} x$$

$$T = 2\pi \sqrt{\frac{m}{k}}$$

$$T = 2\pi \sqrt{\frac{l}{g}}$$

$$\omega^2 = \frac{k}{m}$$

$$v_{max} = \omega A$$

$$a_{max} = \omega^2 A$$

$$x = A \cos \omega t$$

$$v = -\omega A \sin \omega t$$

$$a = -\omega^2 A \cos \omega t$$

$$v = \pm \sqrt{\frac{k}{m}(A^2 - x^2)}$$

$$E = \frac{1}{2} k A^2 = \frac{1}{2} m \omega^2 A^2$$

Þyngdarlögmálið

$$F = G \frac{Mm}{r^2}$$

$$g = G \frac{M}{r^2}$$

$$\frac{a^3}{T^2} = \frac{GM}{4\pi^2}$$

$$U(r) = -G \frac{Mm}{r}$$

$$v_{lausn} = \sqrt{\frac{2GM}{r}}$$