Jöfnur
EÐL103

Hreyfifræði

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

$$s = v_j \cdot t$$

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

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

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

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

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

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

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

$$v = v_o + at$$

$$v = v_o + gt$$

Kraftfræði

$$F = m \cdot a$$

$$F_g = mg$$

$$F_{núin} = \mu F_{þver}$$

$$F = -k \cdot x$$

$$F_{þver} = mg\cos\theta$$

$$F_{samsiða} = mg\sin\theta$$

$$\mu = \tan\theta$$

Vinna og orka

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

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

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

$$K = \frac{1}{2}mv^2$$

$$U = mgh$$

Framhald vinna og orka

$$E = K + U$$

$$W = \Delta E$$

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

$$F \cdot s = \frac{1}{2}mv_2^2 - \frac{1}{2}mv_1^2$$

$$\tau = F_{þver} \cdot a$$

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

Þrýstingur:

$$p = \frac{F_{þver}}{A}$$

$$p = \rho g h + \rho_o$$

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

Varmafræði:

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

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

$$l_{bræðslu} = \frac{Q}{m}$$

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

Atlag og skriðþungi:

$$p = mv$$

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

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

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

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

Ljós

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

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

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

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

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

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

$$stækkun = \frac{b}{a}$$

Jöfnur
EÐL203

Varmafræði

$C = \dfrac{Q}{T}$ (varmrýmd)

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

$l_{bræðslu} = \dfrac{Q}{m}$

$l_{gufu} = \dfrac{Q}{m}$

Gaslögmálið

$T_K = T_c + 273{,}16$

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

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

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

$p_1 V_1 = p_2 V_2$

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

Bylgjufræði:

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

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

$sin\,\theta_n = \dfrac{n\lambda}{d}$

$v = f \cdot \lambda$

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

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

$f_n = \dfrac{v}{\lambda_n} = n \cdot \dfrac{v}{2L} \Rightarrow f_n = nf_{grunn}$

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

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

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

$I = \dfrac{P_{þvert}}{A} = \dfrac{P}{4\pi r^2}$

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

Skákast:

$v_x = v_o cos\theta$

$v_y = v_o sin\theta$

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

$x = x_o + v_x t$

$y = y_o + v_{oy}t + \dfrac{1}{2}gt^2$

Hringhreyfing:

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

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

$$v = r\omega$$

$$a = r\omega^2$$

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

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

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

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

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

Einföld sveifluhreyfing:

$$F = -k \cdot x$$

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

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

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

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

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

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

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

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

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

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

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

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

Þyngdarlögmálið

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

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

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

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

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