

FORMULE – FIZIKA



Gibanje

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

$$a = \frac{v - v_0}{t}$$

$$v = at + v_0$$

$$s = \frac{at^2}{2} + v_0t$$

$$v^2 = 2as + v_0^2$$

$$v = \omega r$$

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

$$a_{\text{cp}} = \frac{v^2}{r}$$

Sila

$$F = ma$$

$$F_{\text{tr}} = \mu F_p$$

$$F_{\text{elast.}} = -kx$$

$$F_g = G \frac{m_1 m_2}{r^2}$$

$$p = mv$$

$$M = Fr$$

Energija

$$W = Fs$$

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

$$E_{\text{gp}} = mgh$$

$$E_k = \frac{mv^2}{2}$$

$$E_{\text{elast.}} = \frac{kx^2}{2}$$

Hidromehanika

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

$$p = \frac{F}{A}$$

$$p = \rho gh$$

$$F_u = \rho gV$$

$$q = \frac{V}{t} = Av$$

$$p_{s1} + \frac{\rho v_1^2}{2} = p_{s2} + \frac{\rho v_2^2}{2}$$

Toplina

$$n = \frac{N}{N_A} = \frac{m}{M}$$

$$pV = nRT$$

$$\bar{E}_k = \frac{3}{2}kT$$

$$l = l_0(1 + \alpha\Delta t)$$

$$Q = mc\Delta t$$

$$Q = mr$$

$$Q = m\lambda$$

$$Q = \Delta U + W$$

$$W = p\Delta V$$

$$\eta = 1 - \frac{T_2}{T_1}$$

Elektrostatika

$$F = \frac{1}{4\pi\epsilon_0\epsilon_r} \cdot \frac{Q_1 Q_2}{r^2}$$

$$E = \frac{F}{Q}$$

$$E = \frac{1}{4\pi\epsilon_0\epsilon_r} \cdot \frac{Q}{r^2}$$

$$U = \frac{W}{Q}$$

$$U = Ed$$

$$\varphi = \frac{1}{4\pi\epsilon_0\epsilon_r} \cdot \frac{Q}{r}$$

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

$$C = \epsilon_0\epsilon_r \frac{S}{d}$$

$$W = \frac{CU^2}{2}$$

Električna struja

$$I = \frac{\Delta Q}{\Delta t}$$

$$I = \frac{U}{R}$$

$$R = \rho \frac{l}{S}$$

$$\mathcal{E} = IR_v + IR_u$$

$$P = UI$$

$$I = \frac{U}{Z}$$

$$R_L = L\omega$$

$$R_C = \frac{1}{C\omega}$$

$$Z = \sqrt{R^2 + (R_L - R_C)^2}$$

Magnetizam

$$B = \mu_0 \mu_r \frac{I}{2\pi d}$$

$$B = \mu_0 \mu_r \frac{I}{2r}$$

$$B = \mu_0 \mu_r \frac{NI}{l}$$

$$F = qvB \sin \alpha$$

$$F = BIl \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$U = -N \frac{\Delta \Phi}{\Delta t}$$

$$U = -L \frac{\Delta I}{\Delta t}$$

$$U = -Blv \sin \alpha$$

$$L = \mu_0 \mu_r \frac{N^2 S}{l}$$

Titranja i valovi

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

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

$$T = 2\pi \sqrt{LC}$$

$$y = y_0 \sin(\omega t + \varphi_0)$$

$$v = v_0 \cos(\omega t + \varphi_0)$$

$$v_0 = \omega y_0$$

$$a = -a_0 \sin(\omega t + \varphi_0)$$

$$a_0 = \omega^2 y_0$$

$$y = y_0 \sin\left(\omega t - \frac{2\pi x}{\lambda} + \varphi_0\right)$$

$$v = \lambda f$$

$$v = \sqrt{\frac{Fl}{m}}$$

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

$$L = 10 \log \frac{I}{I_0}$$

$$f = f_i \frac{v + v_p}{v - v_i}$$

Geometrijska i valna optika

$$\frac{\sin \alpha}{\sin \beta} = \frac{n_2}{n_1}$$

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

$$\frac{1}{f} = \frac{1}{x} + \frac{1}{x'}$$

$$m = \frac{y'}{y} = -\frac{x'}{x}$$

$$s_k = \frac{k\lambda a}{d}$$

$$k\lambda = d \sin \alpha$$

$$\operatorname{tg} \alpha = \frac{n_2}{n_1}$$

Moderna fizika

$$E_f = hf$$

$$E_f = W_{iz} + E_k$$

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

Neke konstante

Gravitacijska konstanta	$G = 6,67 \cdot 10^{-11} \text{ Nm}^2\text{kg}^{-2}$
Avogadrova konstanta	$N_A = 6,022 \cdot 10^{23} \text{ mol}^{-1}$
Dielektričnost vakuumu	$\varepsilon_0 = 8,85 \cdot 10^{-12} \text{ N}^{-1}\text{m}^{-2}\text{C}^2$
Permeabilnost vakuumu	$\mu_0 = 4\pi \cdot 10^{-7} \text{ TmA}^{-1}$
Boltzmanova konstanta	$k = 1,3806 \cdot 10^{-23} \text{ JK}^{-1}$
Opća plinska konstanta	$R = 8,314 \text{ JK}^{-1}\text{mol}^{-1}$
Elementarni naboj	$e = 1,6 \cdot 10^{-19} \text{ C}$
Atomska jedinica mase	$u = 1,66 \cdot 10^{-27} \text{ kg}$
Masa elektrona	$m_e = 9,11 \cdot 10^{-31} \text{ kg}$
Masa protona	$m_p = 1,67 \cdot 10^{-27} \text{ kg}$