



Nacionalni centar  
za vanjsko vrednovanje  
obrazovanja

Identifikacijska  
naljepnica

PAŽLJIVO NALIJEPI

# FIZ

## FIZIKA

Knjižica formula

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# Fizika

## POPIS FORMULA I KONSTANTI

### Kinematika

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

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

$$s = v_0 t + a \frac{t^2}{2}$$

$$v = v_0 + at$$

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

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

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

### Dinamika

$$F = ma$$

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

$$F_{\text{elas}} = -kx$$

$$p = mv$$

$$F\Delta t = \Delta p$$

$$W = \Delta E$$

$$W = Fs \cos \alpha$$

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

$$\Delta E_{\text{gp}} = mg\Delta h$$

$$E_{\text{ep}} = k \frac{x^2}{2}$$

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

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

### Hidromehanika

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

$$p = \rho gh$$

$$F_u = \rho g V$$

$$S_1 v_1 = S_2 v_2$$

$$p_1 + \frac{\rho v_1^2}{2} = p_2 + \frac{\rho v_2^2}{2}$$

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





# Fizika

## Termodinamika

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

$$\overline{E_k} = \frac{3}{2}kT$$

$$pV = nRT$$

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

$$Q = mc\Delta t$$

$$Q_t = m\lambda$$

$$Q_i = mr$$

$$Q = W + \Delta U$$

$$W = p\Delta V$$

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

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## Elektricitet i magnetizam

$$F = \frac{q_1 q_2}{4\pi\epsilon_0\epsilon_r r^2}$$

$$F = qE$$

$$W = qU$$

$$U = Ed$$

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

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

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

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

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

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

$$I = \frac{E}{R_u + R_v}$$

$$P = UI$$

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

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

$$F = BIl \sin \alpha$$

$$F_L = qvB \sin \alpha$$

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

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

$$U_i = -Blv \sin \alpha$$

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

$$R_L = L\omega$$

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

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





# Fizika

## Titranje i valovi

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

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

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

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

$$x = A \sin(\omega t + \varphi_0)$$

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

$$v_0 = \frac{2\pi A}{T}$$

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

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

$$a_0 = \frac{4\pi^2 A}{T^2}$$

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

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

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

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

## Optika

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

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

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

$$\lambda = \frac{sd}{a}$$

$$d \sin \alpha_k = k\lambda$$

$$\operatorname{tg} u_B = n$$

$$f = \frac{R}{2}$$

$$\frac{y'}{y} = -\frac{b}{a}$$

## Moderna fizika

$$L = L_0 \sqrt{1 - \frac{v^2}{c^2}}$$

$$T = \frac{T_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$P = \sigma ST^4$$

$$\lambda_{\max} T = b = \text{konst}$$

$$E = hf$$

$$\frac{m_e v_{\max}^2}{2} = hf - W_i$$

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

$$E = \Delta mc^2$$

$$N = N_0 2^{-\frac{t}{T}} = N_0 e^{-\lambda t}$$

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

$$A = \lambda N$$

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# Fizika

## Konstante

gravitacijska konstanta	$G = 6,67 \cdot 10^{-11} \text{ N kg}^{-2} \text{ m}^2$
ubrzanje slobodnoga pada pri površini Zemlje	$g = 9,81 \text{ m s}^{-2}$ (u zadacima uzeti $10 \text{ m s}^{-2}$ )
masa Zemlje	$M = 6 \cdot 10^{24} \text{ kg}$
polumjer Zemlje	$R = 6370 \text{ km}$
unificirana atomska masa	$u = 1,66 \cdot 10^{-27} \text{ kg}$
Avogadrova konstanta	$N_A = 6,023 \cdot 10^{23} \text{ mol}^{-1}$
opća plinska konstanta	$R = 8,314 \text{ J K}^{-1} \text{ mol}^{-1}$
brzina svjetlosti u vakuumu	$c = 3 \cdot 10^8 \text{ m s}^{-1}$
elementarni naboj	$e = 1,6 \cdot 10^{-19} \text{ C}$
masa elektrona	$m_e = 9,11 \cdot 10^{-31} \text{ kg}$
masa protona	$m_p = 1,67 \cdot 10^{-27} \text{ kg}$
permitivnost vakuumu	$\epsilon_0 = 8,85 \cdot 10^{-12} \text{ F m}^{-1}$
permeabilnost vakuumu	$\mu_0 = 4\pi \cdot 10^{-7} \text{ N A}^{-2}$
Boltzmannova konstanta	$k = 1,38 \cdot 10^{-23} \text{ J K}^{-1}$
Planckova konstanta	$h = 6,626 \cdot 10^{-34} \text{ J s}$
Stefan-Boltzmannova konstanta	$\sigma = 5,67 \cdot 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$
Wienova konstanta	$b = 2,89 \cdot 10^{-3} \text{ K m}$

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# Fizika

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