



Nacionalni centar  
za vanjsko vrednovanje  
obrazovanja

Identifikacijska  
naljepnica

PAŽLJIVO NALIJEPITI

# FIZ

## FIZIKA

Knjižica formula

FIZ T D

FIZ.40.HR.R.T1.08



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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

$$F = ma$$

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

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

$$p = mv$$

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

$$W = \Delta E$$

$$W = Fs \cos\alpha$$

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

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

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

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

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

### 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

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

$$\overline{E_k} = \frac{3}{2} k_B T$$

$$U = \frac{3}{2} N k_B T$$

$$pV = nRT$$

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

$$Q = mc\Delta t$$

$$Q_t = m\lambda$$

$$Q_i = mr$$

$$Q = W + \Delta U$$

$$W = p\Delta V$$

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

## Elektricitet i magnetizam

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

$$k = \frac{1}{4\pi\epsilon_0}$$

$$F = qE$$

$$E = \frac{k}{\epsilon_r} \frac{q}{r^2}$$

$$W = qU$$

$$U = Ed$$

$$\varphi = \frac{k}{\epsilon_r} \frac{q}{r}$$

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

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

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

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

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

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

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

$$P = UI$$

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

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

$$F = BIl \sin \alpha$$

$$F_L = qvB \sin \alpha$$

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

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

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

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

$$R_L = L\omega$$

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

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

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# 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

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

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

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

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

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

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

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

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

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

## Moderna fizika

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

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

$$E = \frac{mc^2}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

$$P = \sigma S T^4$$

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

$$E_f = hf$$

$$E_k = E_f - W_i$$

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

$$E_f = E_n - E_m = -13,6 \text{ eV} \left( \frac{1}{n^2} - \frac{1}{m^2} \right); \quad n > m \quad E = \Delta mc^2 \quad N = N_0 2^{-\frac{t}{T}} = N_0 e^{-\lambda t}$$

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

$$A = \lambda N$$

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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 zadatcima uzeti $10 \text{ m s}^{-2}$ )
masa Zemlje	$M = 6 \cdot 10^{24} \text{ kg}$
polumjer Zemlje	$R = 6370 \text{ km}$
normirani atmosferski tlak	$p_a = 101325 \text{ Pa}$
unificirana atomska masa	$u = 1,66 \cdot 10^{-27} \text{ kg}$
Avogadrova konstanta	$N_A = 6,022 \cdot 10^{23} \text{ mol}^{-1}$
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 naboј	$e = 1,6 \cdot 10^{-19} \text{ C}$
masa elektrona	$m_e = 9,11 \cdot 10^{-31} \text{ kg}$
masa protona	$m_p = 1,67 \cdot 10^{-27} \text{ kg}$
Coulombova konstanta	$k = 9 \cdot 10^9 \text{ Nm}^2 \text{C}^{-2}$
permitivnost vakuuma	$\epsilon_0 = 8,85 \cdot 10^{-12} \text{ F m}^{-1}$
permeabilnost vakuuma	$\mu_0 = 4\pi \cdot 10^{-7} \text{ N A}^{-2}$
prag čujnosti	$I_0 = 10^{-12} \text{ Wm}^{-2}$
Boltzmannova konstanta	$k_B = 1,38 \cdot 10^{-23} \text{ J K}^{-1}$
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	$b = 2,89 \cdot 10^{-3} \text{ K m}$



## Periodni sustav elemenata IUPAC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>H</b> 1,01																	
<b>Li</b> 6,94	<b>Be</b> 9,01																
<b>Na</b> 23,0	<b>Mg</b> 24,3																
<b>K</b> 39,1	<b>Ca</b> 40,1	<b>Sc</b> 45,0	<b>Ti</b> 47,9	<b>V</b> 50,9	<b>Cr</b> 52,0	<b>Mn</b> 54,9	<b>Fe</b> 55,8	<b>Co</b> 58,9	<b>Ni</b> 58,7	<b>Cu</b> 63,5	<b>Zn</b> 65,4	<b>Ga</b> 69,7	<b>Ge</b> 72,6	<b>As</b> 74,9	<b>Se</b> 79,0	<b>Br</b> 79,9	<b>Kr</b> 83,8
<b>Rb</b> 85,5	<b>Sr</b> 87,6	<b>Y</b> 88,9	<b>Zr</b> 91,2	<b>Mo</b> 95,9	<b>Tc</b> [98]	<b>Ru</b> 101	<b>Rh</b> 103	<b>Pd</b> 106	<b>Ag</b> 108	<b>Cd</b> 112	<b>In</b> 115	<b>Sn</b> 119	<b>Sb</b> 122	<b>Te</b> 128	<b>I</b> 127	<b>Xe</b> 131	
<b>Cs</b> 133	<b>Ba</b> 137	<b>La</b> 57-71 lantanoidi	<b>Ta</b> 72	<b>W</b> 73	<b>Re</b> 74	<b>Os</b> 184	<b>Ir</b> 186	<b>Pt</b> 192	<b>Au</b> 195	<b>Hg</b> 197	<b>Tl</b> 201	<b>Pb</b> 207	<b>Bi</b> 209	<b>Po</b> [209]	<b>At</b> [210]	<b>Rn</b> [222]	
<b>Fr</b> [223]	<b>Ra</b> [226]	<b>Rf</b> 89-103 aktinoidi	<b>Db</b> [261]	<b>Sg</b> [266]	<b>Bh</b> [262]	<b>Hs</b> [264]	<b>Mt</b> [277]	<b>Ds</b> [268]	<b>Rg</b> [272]	<b>Cn</b> [285]							

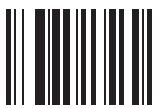
<b>La</b> 139	<b>Ce</b> 140	<b>Pr</b> 141	<b>Nd</b> 144	<b>Pm</b> [145]	<b>Sm</b> 150	<b>Eu</b> 152	<b>Gd</b> 157	<b>Tb</b> 159	<b>Dy</b> 163	<b>Ho</b> 165	<b>Tm</b> 167	<b>Er</b> 169	<b>Yb</b> 173	<b>Lu</b> 175			
<b>Ac</b> [227]	<b>Th</b> 232	<b>Pa</b> 231	<b>U</b> 238	<b>Np</b> [237]	<b>Pu</b> [244]	<b>Am</b> [243]	<b>Cm</b> [247]	<b>Bk</b> [247]	<b>Cf</b> [251]	<b>Es</b> [252]	<b>Fm</b> [257]	<b>Md</b> [258]	<b>No</b> [259]	<b>Lr</b> [262]			



# Fizika

Prazna Stranica

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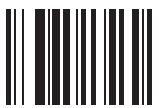


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# Fizika

Prazna Stranica

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