



Nacionalni centar
za vanjsko vrednovanje
obrazovanja

Identifikacijska
naljepnica

PAŽLJIVO NALIJEPI

FIZIKA

DRŽAVNA MATURA
šk. god. 2026./2027.

KNJIŽICA FORMULA

POPIS FORMULA I KONSTANTI

Kinematika

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

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

$$s = v_0 t + \frac{1}{2} a t^2$$

$$v = v_0 + at$$

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

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

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

Dinamika

$$a = \frac{F}{m}$$

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

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

$$p = mv$$

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

$$W = \Delta E$$

$$W = Fs \cos \alpha$$

$$E_{\text{k}} = \frac{mv^2}{2}$$

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

$$E_{\text{ep}} = \frac{1}{2} kx^2$$

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

$$\eta = \frac{W_{\text{d}}}{W_{\text{u}}}$$

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

Hidromehanika

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

$$p = \rho gh$$

$$F_{\text{u}} = \rho g V$$

$$S_1 v_1 = S_2 v_2$$

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

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

Termodinamika

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

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

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

$$pV = nRT$$

$$\ell = \ell_0 (1 + \alpha \Delta t)$$

$$Q = mc \Delta t$$

$$Q_t = m \lambda$$

$$Q_i = m r$$

$$Q = W + \Delta U$$

$$W = p \Delta V$$

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

Elektricitet i magnetizam

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

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

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

$$W = qU$$

$$E = \frac{U}{d}$$

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

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

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

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

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

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

$$R_u = R_1 + R_2 + R_3 + \dots + R_n$$

$$\frac{1}{R_u} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$$

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

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

$$P = UI$$

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

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

$$F = BI \ell \sin \alpha$$

$$F_L = qvB \sin \alpha$$

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

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

$$U_i = -B \ell v \sin \alpha$$

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

$$R_L = L\omega$$

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

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

$$i = i_0 \sin(\omega t + \varphi_0)$$

$$\frac{N_1}{N_2} = \frac{U_1}{U_2} = \frac{I_2}{I_1}$$

Titranje i valovi

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Optika

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

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

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

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

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

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

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

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

Moderna fizika

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

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

$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$E_f = hf$$

$$E_f = W_i + E_k$$

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

$$E_f = E_n - E_m = -13,6 \text{ eV} \left(\frac{1}{n^2} - \frac{1}{m^2} \right); \quad n > m$$

$$E = \Delta mc^2$$

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

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

$$A = \lambda N$$

Konstante

gravitacijska konstanta	$G = 6,67 \cdot 10^{-11} \text{ N kg}^{-2} \text{ m}^2$
ubrzanje slobodnoga pada pri površini Zemlje	$g = 9,81 \text{ ms}^{-2}$ (u zadacima uzeti 10 ms^{-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	$R = 8,314 \text{ JK}^{-1} \text{ mol}^{-1}$
brzina svjetlosti u vakuumu	$c = 3 \cdot 10^8 \text{ ms}^{-1}$
elementarni naboj	$e = 1,6 \cdot 10^{-19} \text{ C}$
masa elektrona	$m_e = 9,11 \cdot 10^{-31} \text{ kg}$
masa protona	$m_p = 1,67 \cdot 10^{-27} \text{ kg}$
Coulombova konstanta	$k = 9 \cdot 10^9 \text{ Nm}^2 \text{ C}^{-2}$
permitivnost vakuumu	$\epsilon_0 = 8,85 \cdot 10^{-12} \text{ F m}^{-1}$
permeabilnost vakuumu	$\mu_0 = 4\pi \cdot 10^{-7} \text{ T m A}^{-1}$
prag čujnosti	$I_0 = 10^{-12} \text{ W m}^{-2}$
Boltzmannova konstanta	$k_B = 1,38 \cdot 10^{-23} \text{ JK}^{-1}$
Planckova konstanta	$h = 6,626 \cdot 10^{-34} \text{ Js}$

Periodni sustav elemenata IUPAC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					
1 H 1,01				2 He 4,00																		
3	4 Be 9,01			5 B 10,8														6 C 12,0	7 N 14,0	8 O 16,0	9 F 19,0	10 Ne 20,2
11	12 Mg 24,3			13 Al 27,0														14 Si 28,1	15 P 31,0	16 S 32,1	17 Cl 35,5	18 Ar 39,9
19	20 Ca 40,1	21 Sc 45,0	22 Ti 47,9	23 V 50,9	24 Cr 52,0	25 Mn 54,9	26 Fe 55,8	27 Co 58,9	28 Ni 58,7	29 Cu 63,5	30 Zn 65,4	31 Ga 69,7	32 Ge 72,6	33 As 74,9	34 Se 79,0	35 Br 79,9	36 Kr 83,8					
37	38 Sr 87,6	39 Y 88,9	40 Zr 91,2	41 Nb 92,9	42 Mo 95,9	43 Tc [98]	44 Ru 101	45 Rh 103	46 Pd 106	47 Ag 108	48 Cd 112	49 In 115	50 Sn 119	51 Sb 122	52 Te 128	53 I 127	54 Xe 131					
55	56 Ba 137	57-71 lantanoidi	72 Hf 178	73 Ta 181	74 W 184	75 Re 186	76 Os 190	77 Ir 192	78 Pt 195	79 Au 197	80 Hg 201	81 Tl 204	82 Pb 207	83 Bi 209	84 Po [209]	85 At [210]	86 Rn [222]					
87	88 Ra [226]	89-103 aktinoidi	104 Rf [261]	105 Db [262]	106 Sg [266]	107 Bh [264]	108 Hs [277]	109 Mt [268]	110 Ds [269]	111 Rg [272]	112 Cn [285]											
57	58 Ce 140	59 Pr 141	60 Nd 144	61 Pm [145]	62 Sm 150	63 Eu 152	64 Gd 157	65 Tb 159	66 Dy 163	67 Ho 165	68 Er 167	69 Tm 169	70 Yb 173	71 Lu 175								
89	90 Th 232	91 Pa 231	92 U 238	93 Np [237]	94 Pu [244]	95 Am [243]	96 Cm [247]	97 Bk [247]	98 Cf [251]	99 Es [252]	100 Fm [257]	101 Md [258]	102 No [259]	103 Lr [262]								

Prazna stranica

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