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ПАЖЉИВО НАЛЕПИТИ

# FIZ

**ФИЗИКА**  
КЊИЖИЦА ФОРМУЛА

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## ПОПИС ФОРМУЛА И КОНСТАНТИ

### Кинематика

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

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

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

$$v = v_0 + at$$

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

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

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

### Динамика

$$F = ma$$

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

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

$$p = mv$$

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

$$W = \Delta E$$

$$W = Fs \cos \alpha$$

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

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

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

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

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

### Хидромеханика

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

$$p = \rho gh$$

$$F_u = \rho g V$$

$$S_1 v_1 = S_2 v_2$$

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

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

## Термодинамика

$$n = \frac{N}{N_A} = \frac{m}{M} \quad \overline{E_k} = \frac{3}{2} k_B T \quad U = \frac{3}{2} N k_B T \quad pV = nRT$$

$$\ell = \ell_0 (1 + \alpha \Delta t) \quad Q = mc \Delta t \quad Q_t = m \lambda \quad Q_i = mr$$

$$Q = W + \Delta U \quad W = p \Delta V \quad \eta = 1 - \frac{T_2}{T_1}$$

## Електрицитет и магнетизам

$$F = \frac{k}{\epsilon_r} \frac{q_1 q_2}{r^2} \quad k = \frac{1}{4\pi\epsilon_0} \quad F = qE \quad E = \frac{k}{\epsilon_r} \frac{q}{r^2}$$

$$W = qU \quad U = Ed \quad \varphi = \frac{k}{\epsilon_r} \frac{q}{r} \quad C = \frac{q}{U}$$

$$C = \epsilon_0 \epsilon_r \frac{S}{d} \quad W = \frac{CU^2}{2} \quad I = \frac{\Delta q}{\Delta t} \quad I = \frac{U}{R}$$

$$R = \rho \frac{\ell}{S} \quad I = \frac{\mathcal{E}}{R_u + R_v} \quad P = UI \quad B = \mu_0 \mu_r \frac{I}{2r\pi}$$

$$B = \mu_0 \mu_r \frac{NI}{\ell} \quad F = BI \ell \sin \alpha \quad F_L = qvB \sin \alpha \quad \Phi = BS \cos \alpha$$

$$U_i = -N \frac{\Delta \Phi}{\Delta t} \quad U_i = -B \ell v \sin \alpha \quad I = \frac{U}{Z} \quad R_L = L\omega$$

$$R_C = \frac{1}{C\omega} \quad Z = \sqrt{R^2 + (R_L - R_C)^2}$$

## Осциловање и таласи

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Оптика

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

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

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

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

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

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

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

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

## Модерна физика

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

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

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

$$E_f = hf$$

$$E_k = E_f - W_i$$

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

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

$$E = \Delta mc^2$$

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

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

$$A = \lambda N$$

## Константе

|   |  |
|---|--|
| гравитациона константа                    | $G = 6,67 \cdot 10^{-11} \text{ Nkg}^{-2}\text{m}^2$                   |
| убрзање слободног пада при површини Земље | $g = 9,81 \text{ ms}^{-2}$<br>(у задацима узети $10 \text{ ms}^{-2}$ ) |
| маса Земље                                | $M = 6 \cdot 10^{24} \text{ kg}$                                       |
| полупречник Земље                         | $R = 6370 \text{ km}$  |
| стандардни атмосферски притисак           | $p_a = 101325 \text{ Pa}$  |
| унифицирана атомска маса                  | $u = 1,66 \cdot 10^{-27} \text{ kg}$                                   |
| Авогадрова константа                      | $N_A = 6,022 \cdot 10^{23} \text{ mol}^{-1}$                           |
| општа гасна константа                     | $R = 8,314 \text{ JK}^{-1}\text{mol}^{-1}$                             |
| брзина светлости у вакууму                | $c = 3 \cdot 10^8 \text{ ms}^{-1}$                                     |
| елементарно наелектрисање                 | $e = 1,6 \cdot 10^{-19} \text{ C}$                                     |
| маса електрона                            | $m_e = 9,11 \cdot 10^{-31} \text{ kg}$                                 |
| маса протона                              | $m_p = 1,67 \cdot 10^{-27} \text{ kg}$                                 |
| Кулонова константа                        | $k = 9 \cdot 10^9 \text{ Nm}^2\text{C}^{-2}$                           |
| пермитивност вакуума                      | $\epsilon_0 = 8,85 \cdot 10^{-12} \text{ Fm}^{-1}$                     |
| пермеабилност вакуума                     | $\mu_0 = 4\pi \cdot 10^{-7} \text{ NA}^{-2}$                           |
| граница чујности                          | $I_0 = 10^{-12} \text{ Wm}^{-2}$                                       |
| Болцманова константа                      | $k_B = 1,38 \cdot 10^{-23} \text{ JK}^{-1}$                            |
| Планкова константа                        | $h = 6,626 \cdot 10^{-34} \text{ Js}$                                  |

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|                   |                   |                     |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                   |                   |                   |
|-------------------|-------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| 1                 | 2                 | 3                   | 4                  | 5                  | 6                  | 7                  | 8                  | 9                  | 10                 | 11                 | 12                 | 13                 | 14                 | 15                 | 16                | 17                | 18                |
| 1<br>H<br>1,01    |                   | 2<br>He<br>4,00     |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                   |                   |                   |
| 3<br>Li<br>6,94   | 4<br>Be<br>9,01   |                     |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                   |                   |                   |
| 11<br>Na<br>23,0  | 12<br>Mg<br>24,3  |                     |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                   |                   |                   |
| 19<br>K<br>39,1   | 20<br>Ca<br>40,1  | 21<br>Sc<br>45,0    | 22<br>Ti<br>47,9   | 23<br>V<br>50,9    | 24<br>Cr<br>52,0   | 25<br>Mn<br>54,9   | 26<br>Fe<br>55,8   | 27<br>Co<br>58,9   | 28<br>Ni<br>58,7   | 29<br>Cu<br>63,5   | 30<br>Zn<br>65,4   | 31<br>Ga<br>69,7   | 32<br>Ge<br>72,6   | 33<br>As<br>74,9   | 34<br>Se<br>79,0  | 35<br>Br<br>79,9  | 36<br>Kr<br>83,8  |
| 37<br>Rb<br>85,5  | 38<br>Sr<br>87,6  | 39<br>Y<br>88,9     | 40<br>Zr<br>91,2   | 41<br>Nb<br>92,9   | 42<br>Mo<br>95,9   | 43<br>Tc<br>[98]   | 44<br>Ru<br>101    | 45<br>Rh<br>103    | 46<br>Pd<br>106    | 47<br>Ag<br>108    | 48<br>Cd<br>112    | 49<br>In<br>115    | 50<br>Sn<br>119    | 51<br>Sb<br>122    | 52<br>Te<br>128   | 53<br>I<br>127    | 54<br>Xe<br>131   |
| 55<br>Cs<br>133   | 56<br>Ba<br>137   | 57-71<br>lantanoidi | 72<br>Hf<br>178    | 73<br>Ta<br>181    | 74<br>W<br>184     | 75<br>Re<br>186    | 76<br>Os<br>190    | 77<br>Ir<br>192    | 78<br>Pt<br>195    | 79<br>Au<br>197    | 80<br>Hg<br>201    | 81<br>Tl<br>204    | 82<br>Pb<br>207    | 83<br>Bi<br>209    | 84<br>Po<br>[209] | 85<br>At<br>[210] | 86<br>Rn<br>[222] |
| 87<br>Fr<br>[223] | 88<br>Ra<br>[226] | 89-103<br>aktinoidi | 104<br>Rf<br>[261] | 105<br>Db<br>[262] | 106<br>Sg<br>[266] | 107<br>Bh<br>[264] | 108<br>Hs<br>[277] | 109<br>Mt<br>[268] | 110<br>Ds<br>[269] | 111<br>Rg<br>[272] | 112<br>Cn<br>[285] |                    |                    |                    |                   |                   |                   |
|                   |                   |                     |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                   |                   |                   |
| 57<br>La<br>139   | 58<br>Ce<br>140   | 59<br>Pr<br>141     | 60<br>Nd<br>144    | 61<br>Pm<br>[145]  | 62<br>Sm<br>150    | 63<br>Eu<br>152    | 64<br>Gd<br>157    | 65<br>Tb<br>159    | 66<br>Dy<br>163    | 67<br>Ho<br>165    | 68<br>Er<br>167    | 69<br>Tm<br>169    | 70<br>Yb<br>173    | 71<br>Lu<br>175    |                   |                   |                   |
| 89<br>Ac<br>[227] | 90<br>Th<br>232   | 91<br>Pa<br>231     | 92<br>U<br>238     | 93<br>Np<br>[237]  | 94<br>Pu<br>[244]  | 95<br>Am<br>[243]  | 96<br>Cm<br>[247]  | 97<br>Bk<br>[247]  | 98<br>Cf<br>[251]  | 99<br>Es<br>[252]  | 100<br>Fm<br>[257] | 101<br>Md<br>[258] | 102<br>No<br>[259] | 103<br>Lr<br>[262] |                   |                   |                   |

Празна страница

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