



Nacionalni centar  
za vanjsko vrednovanje  
obrazovanja

Adesivo per l'identificazione

INCOLLARE ATTENTAMENTE

# FISICA

DRŽAVNA MATURA

šk. god. 2023./2024.

FASCICOLO DELLE FORMULE

---

FIZ.58.IT.R.T1.08



58687

## ELENCO DELLE FORMULE E DELLE COSTANTI

### Cinematica

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

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

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

$$v = v_0 + a t$$

$$v^2 = v_0^2 + 2 a s$$

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

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

### Dinamica

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

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

$$F_{elas} = k x$$

$$p = m v$$

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

$$W = \Delta E$$

$$W = F s \cos \alpha$$

$$E_k = \frac{m v^2}{2}$$

$$\Delta E_{gp} = m g \Delta h$$

$$E_{cp} = \frac{1}{2} k x^2$$

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

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

### Idromeccanica

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

$$p = \rho g h$$

$$F_u = \rho g V$$

$$S_1 v_1 = S_2 v_2$$

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

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

**Termodinamica**

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

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

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

**Elettricità e magnetismo**

$$F = \frac{k}{\epsilon_r} \frac{q_1 q_2}{r^2} \quad E = \frac{F}{q} \quad E = \frac{k}{\epsilon_r} \frac{q}{r^2} \quad W = qU$$

$$E = \frac{U}{d} \quad \varphi = \frac{k}{\epsilon_r} \frac{q}{r} \quad C = \frac{q}{U} \quad C = \epsilon_0 \epsilon_r \frac{S}{d}$$

$$W = \frac{CU^2}{2} \quad I = \frac{\Delta q}{\Delta t} \quad I = \frac{U}{R} \quad R = \rho \frac{\ell}{S}$$

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

$$F = BI \ell \sin \alpha \quad F_L = qvB \sin \alpha \quad \Phi = BS \cos \alpha \quad U_i = -N \frac{\Delta \Phi}{\Delta t}$$

$$U_i = -B \ell v \sin \alpha \quad I = \frac{U}{Z} \quad R_L = L \omega \quad R_C = \frac{1}{C \omega}$$

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

## Oscillazioni e onde

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Ottica

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

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

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

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

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

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

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

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

## Fisica moderna

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

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

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

$$E_f = hf$$

$$E_f = W_i + E_k$$

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

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

$$E = \Delta mc^2$$

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

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

$$A = \lambda N$$

**Costanti**

costante gravitazionale	$G = 6,67 \cdot 10^{-11} \text{ N kg}^{-2} \text{ m}^2$
accelerazione della caduta libera sulla superficie terrestre	$g = 9,81 \text{ m s}^{-2}$ (prendere $10 \text{ m s}^{-2}$ )
massa della Terra	$M = 6 \cdot 10^{24} \text{ kg}$
raggio terrestre	$R = 6370 \text{ km}$
pressione atmosferica standard	$p_a = 101325 \text{ Pa}$
massa atomica unificata	$u = 1,66 \cdot 10^{-27} \text{ kg}$
costante di Avogadro	$N_A = 6,022 \cdot 10^{23} \text{ mol}^{-1}$
costante universale di un gas	$R = 8,314 \text{ J K}^{-1} \text{ mol}^{-1}$
velocità della luce nel vuoto	$c = 3 \cdot 10^8 \text{ m s}^{-1}$
carica elementare	$e = 1,6 \cdot 10^{-19} \text{ C}$
massa dell'elettrone	$m_e = 9,11 \cdot 10^{-31} \text{ kg}$
massa del protone	$m_p = 1,67 \cdot 10^{-27} \text{ kg}$
costante di Coulombo	$k = 9 \cdot 10^9 \text{ N m}^2 \text{ C}^{-2}$
costante dielettrica nel vuoto	$\epsilon_0 = 8,85 \cdot 10^{-12} \text{ F m}^{-1}$
permeabilità nel vuoto	$\mu_0 = 4\pi \cdot 10^{-7} \text{ N A}^{-2}$
soglia di udibilità	$I_0 = 10^{-12} \text{ W m}^{-2}$
costante di Boltzmann	$k_B = 1,38 \cdot 10^{-23} \text{ J K}^{-1}$
costante di Planck	$h = 6,626 \cdot 10^{-34} \text{ J s}$

Sistema periodico degli elementi – 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 Li 6,94	4 Be 9,01		5 B 10,8														
11 Na 23,0	12 Mg 24,3		6 C 12,0														
			7 N 14,0														
			8 O 16,0														
			9 F 19,0														
			10 Ne 20,2														
			11 Na 23,0														
			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 K 39,1														
			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 Rb 85,5														
			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 Cs 133														
			56 Ba 137														
			57-71 lantanoidi														
			58 Hf 178														
			59-103 aktinoidi														
			60 Ta 181														
			61 W 184														
			62 Re 186														
			63 Os 190														
			64 Ir 192														
			65 Pt 195														
			66 Au 197														
			67 Hg 201														
			68 Tl 204														
			69 Pb 207														
			70 Bi 209														
			71 Po [209]														
			72 At [210]														
			73 Rn [222]														
			74 Fr [223]														
			75 Ra [226]														
			76 Ac [227]														
			77 Th 232														
			78 Pa 231														
			79 U 238														
			80 Np [237]														
			81 Pu [244]														
			82 Am [243]														
			83 Cm [247]														
			84 Bk [247]														
			85 Cf [251]														
			86 Es [252]														
			87 Fm [257]														
			88 Md [258]														
			89 No [259]														
			90 Lr [262]														
			91 Lu 175														
			92 Yb 173														
			93 Tm 169														
			94 Er 167														
			95 Ho 165														
			96 Dy 163														
			97 Tb 159														
			98 Gd 157														
			99 Eu 152														
			100 Sm 150														
			101 Pm [145]														
			102 Nd 144														
			103 Pr 141														
			104 Ce 140														
			105 La 139														
			106 Lu 175														
			107 Yb 173														
			108 Tm 169														
			109 Er 167														
			110 Ho 165														
			111 Dy 163														
			112 Tb 159														
			113 Gd 157														
			114 Eu 152														
			115 Sm 150														
			116 Pm [145]														
			117 Nd 144														
			118 Pr 141														
			119 Ce 140														
			120 La 139														
			121 Lu 175														
			122 Yb 173														
			123 Tm 169														
			124 Er 167														
			125 Ho 165														
			126 Dy 163														
			127 Tb 159														
			128 Gd 157														
			129 Eu 152														
			130 Sm 150														
			131 Pm [145]														
			132 Nd 144														
			133 Pr 141														
			134 Ce 140														
			135 La 139														
			136 Lu 175														
			137 Yb 173														
			138 Tm 169														
			139 Er 167														
			140 Ho 165														
			141 Dy 163														
			142 Tb 159														
			143 Gd 157														
			144 Eu 152														
			145 Sm 150														
			146 Pm [145]														
			147 Nd 144														
			148 Pr 141														
			149 Ce 140														
			150 La 139														
			151 Lu 175														
			152 Yb 173														
			153 Tm 169														
			154 Er 167														
			155 Ho 165														
			156 Dy 163														
			157 Tb 159														
			158 Gd 157														
			159 Eu 152														
			160 Sm 150														
			161 Pm [145]														
			162 Nd 144														
			163 Pr 141														
			164 Ce 140														
			165 La 139														
			166 Lu 175														
			167 Yb 173														
			168 Tm 169														
			169 Er 167														
			170 Ho 165														
			171 Dy 163														
			172 Tb 159														
			173 Gd 157														
			174 Eu 152														
			175 Sm 150														
			176 Pm [145]														
			177 Nd 144														
			178 Pr 141														
			179 Ce 140														
			180 La 139														
			181 Lu 175														
			182 Yb 173														
			183 Tm 169														
			184 Er 167														
			185 Ho 165														
			186 Dy 163														
			187 Tb 159														
			188 Gd 157														
			189 Eu 152														
			190 Sm 150														
			191 Pm [145]														
			192 Nd 144														
			193 Pr 141														
			194 Ce 140														
			195 La 139														
			196 Lu 175														
			197 Yb 173														
			198 Tm 169														
			199 Er 167														
			200 Ho 165														
			201 Dy 163														
			202 Tb 159														
			203 Gd 157														
			204 Eu 152														
			205 Sm 150														
			206 Pm [145]														
			207 Nd 144														
			208 Pr 141														
			209 Ce 140														
			210 La 139														
			211 Lu 175														
			212 Yb 173														
			213 Tm 169														
			214 Er 167														
			215 Ho 165														
			216 Dy 163														
			217 Tb 159														
			218 Gd 157														
			219 Eu 152														
			220 Sm 150														
			221 Pm [145]														
			222 Nd 144														
			223 Pr 141														
			224 Ce 140														
			225 La 139														
			226 Lu 175														
			227 Yb 173														
			228 Tm 169														
			229 Er 167														
			230 Ho 165														
			231 Dy 163														
			232 Tb 159														
			233 Gd 157														
			234 Eu 152														
			235 Sm 150														
			236 Pm [145]														
			237 Nd 144														
			238 Pr 141														
			239 Ce 140														
			240 La 139														
			241 Lu 175														
			242 Yb 173														
			243 Tm 169														
			244 Er 167														
			245 Ho 165														
			246 Dy 163														
			247 Tb 159														
			248 Gd 157														
			249 Eu 152														
			250 Sm 150														
			251 Pm [145]														
			252 Nd 144														
			253 Pr 141														
			254 Ce 140														
			255 La 139														
			256 Lu 175														
			257 Yb 173														
			258 Tm 169														
			259 Er 167														
			260 Ho 165														
			261 Dy 163														
			262 Tb 159														
			263 Gd 157														
			264 Eu 152														
			265 Sm 150														
			266 Pm [145]														
			267 Nd 144														
			268 Pr 141														
			269 Ce 140														
			270 La 139														
			271 Lu 175														
			272 Yb 173														
			273 Tm 169														
			274 Er 167														
			275 Ho 165														
			276 Dy 163														
			277 Tb 159														
			278 Gd 157														
			279 Eu 152														
			280 Sm 150														
			281 Pm [145]														
			282 Nd 144														
			283 Pr 141														
			284 Ce 140														
			285 La 139														
			286 Lu 175														
			287 Yb 173														
			288 Tm 169														
			289 Er 167														
			290 Ho 165														
			291 Dy 163														
			292 Tb 159														
			293 Gd 157														
			294 Eu 152														
			295 Sm 150														
			296 Pm [145]														
			297 Nd 144														
			298 Pr 141														
			299 Ce 140														
			300 La 139														
			301 Lu 175														
			302 Yb 173														
			303 Tm 169														
			304 Er 167														
			305 Ho 165														
			306 Dy 163														
			307 Tb 159														
			308 Gd 157														
			309 Eu 152														
			310 Sm 150														
			311 Pm [145]														
			312 Nd 144														
			313 Pr 141														
			314 Ce 140														
			315 La 139														
			316 Lu 175														
			317 Yb 173														
			318 Tm 169														
			319 Er 167														
			320 Ho 165														
			321 Dy 163														
			322 Tb 159														
			323 Gd 157														
			324 Eu 152														
			325 Sm 150														
			326 Pm [145]														
			327 Nd 144														
			328 Pr 141														
			329 Ce 140														
			330 La 139														
			331 Lu 175														
			332 Yb 173														
			333 Tm 169														
			334 Er 167														
			335 Ho 165														
			336 Dy 163														
			337 Tb 159														
			338 Gd 157														
			339 Eu 152														
			340 Sm 150														
			341 Pm [145]														
			342 Nd 144														
			343 Pr 141														
			344 Ce 140														
			345 La 139														
			346 Lu 175														
			347 Yb 173														
			348 Tm 169														
			349 Er 167														
			350 Ho 165														
			351 Dy 163														
			352 Tb 159														
			353 Gd 157														
			354 Eu 152														
			355 Sm 150														
			356 Pm [145]														
			357 Nd 144														
			358 Pr 141														
			359 Ce 140														
			360 La 139														
			361 Lu 175														
			362 Yb 173														
			363 Tm 169														
			364 Er 167														
			365 Ho 165														
			366 Dy 163														
			367 Tb 159														
			368 Gd 157														
			369 Eu 152														
			370 Sm 150														
			371 Pm [145]														
			372 Nd 144														
			373 Pr 141														
			374 Ce 140														
			375 La 139														
			376 Lu 175														
			377 Yb 173														
			378 Tm 169														
			379 Er 167														
			380 Ho 165														
			381 Dy 163														
			382 Tb 159														
			383 Gd 157														
			384 Eu 152														
			385 Sm 150														
			386 Pm [145]														
			387 Nd 144														
			388 Pr 141														
			389 Ce 140														
			390 La 139														
			391 Lu 175														
			392 Yb 173														
			393 T														

Pagina vuota

Pagina vuota