Výpočet neznámé ze vzorce

Z daných vzorců vyjádři neznámou uvedenou ve vedlejším sloupci a uprav do jednoduchého zlomku. Poslední sloupec obsahuje řešení

1.	$S=\frac{1}{2}a v_a$	a, v_a	$a=\frac{2S}{v_a}; v_a=\frac{2S}{a}$
2.	$o=2\pi r$	r	$r=\frac{o}{2\pi}$
	$V=abc$	a,b,c	$a=\frac{V}{bc}; b=\frac{V}{ac}; c=\frac{V}{ab}$
3.	$S=2(ab+bc+ac)$	c	$c=\frac{S}{2(a+b)}-\frac{ab}{a+b}$
4.	$S=\frac{1}{2}(a+c)v$	a,v	$v=\frac{2S}{a+c}; a=\frac{2S}{v}-c$
5.	$V=\frac{1}{3}S_p h$	S_p, h	$S_p=\frac{3V}{h}; h=\frac{3V}{S_p}$
6.	$V=\frac{1}{3}\pi r^2 h$	r,h	$r=\sqrt{\frac{3V}{\pi h}}; h=\frac{3V}{\pi r^2}$
7.	$l=l_0(1+\alpha t)$	l_0, α, t	$l_0=\frac{l}{1+\alpha t}; \alpha=\frac{l}{l_0 t}-\frac{1}{t}; t=\frac{l}{l_0\alpha}-\frac{1}{\alpha}$
8.	$v=v_0+at$	a, v_0	$a=\frac{v-v_0}{t}; v_0=v-at$
9.	$Ft=m(v_2-v_1)$	m, v_1, v_2	$m=\frac{Ft}{v_2-v_1}; v_1=v_2-\frac{Ft}{m}; v_2=\frac{Ft}{m}+v_1$
10.	$E_p=mgh$	m, g	$m=\frac{E_p}{gh}; g=\frac{E_p}{mh}$
11.	$E_k=\frac{1}{2}mv^2$	m, v^2	$m=\frac{2E_k}{v^2}; v=\sqrt{\frac{2E_k}{m}}$
12.	$v=\frac{2\pi r}{T}$	r, T	$r=\frac{vT}{2\pi}; T=\frac{2\pi r}{v}$
13.	$m_1 c_1(t-t_1)=m_2 c_2(t_2-t)$	t, t_1	$t=\frac{m_1 c_1 t_1+m_2 c_2 t_2}{m_1 c_1+m_2 c_2}; t_1=t-\frac{m_2 c_2(t_2-t)}{m_1 c_1}$
14.	$b=\frac{aR}{R+V}$	a, R, V	$a=\frac{b(R+V)}{R}; R=\frac{-bV}{b-a}; V=\frac{R(a-b)}{b}$
15.	$V_0=\frac{V}{1+\gamma t}\cdot\frac{p}{p_0}$	V, p_0, t	$V=\frac{V_0 p_0(1+\gamma t)}{p}; p_0=\frac{V}{1+\gamma t}\cdot\frac{p}{V_0}; t=\frac{1}{\gamma}\cdot\frac{V}{V_0}\cdot\frac{p}{p_0}-\frac{1}{\gamma}$
16.	$I=\frac{E_2-E_1}{R}$	R, E_1	$R=\frac{E_2-E_1}{I}; E_1=E_2-IR$
17.	$I=\frac{nE}{R+nr}$	R, E, n, r	$R=\frac{nE}{I}-nr; E=\frac{I(R+nr)}{n}; n=\frac{IR}{E-rI}; r=\frac{E}{I}-\frac{R}{n}$
18.	$\frac{1}{a}+\frac{1}{b}=\frac{1}{f}$	b, f	$b=\frac{af}{a-f}; f=\frac{ab}{a+b}$

19.	$\frac{1}{R_1}+\frac{1}{R_2}=\frac{1}{R}$	R, R_1	$R=\frac{R_1 R_2}{R_1+R_2}\,; R_1=\frac{R R_2}{R_2-R}$
20.	$\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}=\frac{1}{R}$	R_3	$R_3=\frac{R R_1 R_2}{R_1 R_2-R R_1-R R_2}$
21.	$I=\frac{E}{R+\frac{r}{n}}$	n, r, R	$n=\frac{I r}{E-I R}\,; r=\frac{n(E-I R)}{I}\,; R=\frac{E}{I}-\frac{r}{n}$
22.	$I=\frac{m R}{R+\frac{m}{n} r}$	m, n, r, R	$m=\frac{n I R}{n R-I r}\,; n=\frac{r m I}{R(m-I)}\,; r=\frac{R n(m-I)}{m I}\,; R=\frac{m r I}{n(m-I)}$
23.	$R=\rho \frac{l}{\pi \frac{d^2}{4}}$	ρ, l, d^2, d	$\rho=\frac{\pi R d^2}{4 l}\,; l=\frac{\pi R d^2}{4 \rho}\,; d^2=\frac{4 \rho l}{\pi R}\,; d=\sqrt{\frac{4 \rho l}{\pi R}}$
24.	$F=\frac{1}{2} C S \rho v^2$	$C, 2, v$	$C=\frac{2 F}{S \rho v^2}\,; 2=\frac{C S \rho v^2}{F}\,; v=\sqrt{\frac{2 F}{\rho C S}}$
25.	$E_n=\frac{h^2}{8 m L^2} n^2$	m, n, L	$m=\frac{h^2}{8 E_n L^2} n^2\,; n=\frac{L}{h} \sqrt{8 m E_n}\,; L=h n \sqrt{\frac{1}{8 m E_n}}$
26.	$Z=-\frac{f}{a-f}$	a, f	$a=-\frac{f}{Z}+f\,; f=\frac{a Z}{Z-1}$
27.	$h f=W+\frac{1}{2} m v^2$	f, m, v	$f=\frac{1}{h}\left(W+\frac{1}{2} m v^2\right); m=\frac{2(h f-W)}{v^2}\,; v=\sqrt{\frac{2(h f-W)}{m}}$
28.	$v=\sqrt{\frac{\kappa M}{R+h}}$	R, M	$R=\frac{\kappa M-v^2 h}{v^2}\,; M=\frac{v^2(R+h)}{\kappa}$
29.	$T=2 \pi \sqrt{\frac{l}{g}}$	l, g	$l=\frac{g T^2}{4 \pi^2}\,; g=\frac{4 \pi^2 l}{T^2}$
30.	$u=\sqrt{a^2+b^2+c^2}$	c	$c=\sqrt{u^2-a^2-b^2}$
31.	$f=\frac{1}{2 \pi} \sqrt{\frac{k}{m}}$	k, m	$k=4 \pi^2 f^2 m\,; m=\frac{k}{4 \pi^2 f^2}$
32.	$l=l_0 \sqrt{1-\frac{v^2}{c^2}}$	v, c	$v=c \sqrt{1-\frac{l^2}{l_0^2}}\,; c=\frac{v\, l_0}{\sqrt{l_0^2-l^2}}$
33.	$V=\frac{\pi v}{6}\left(3 \rho_1^2+3 \rho_2^2+v^2\right)$	π, ρ_1	$\pi=\frac{6 V}{v\left(3 \rho_1^2+3 \rho_2^2+v^2\right)}\,; \rho_1=\sqrt{\frac{2 V}{\pi v}-\rho_2^2-\frac{v^2}{3}}$
34.	$v=\frac{\left(d_1+d_2\right) v_1 v_2}{d_1 v_2+d_2 v_1}$	d_2, v_1	$d_2=\frac{d_1 v_2\left(v-v_1\right)}{v_1\left(v_2-v\right)}\,; v_1=\frac{d_1 v_2 v}{d_1 v_2+d_2 v_2-d_2 v}$
35.	$u=\frac{u'+v}{1+\frac{u' \cdot v}{c^2}}$	v	$v=\frac{c^2\left(u-u'\right)}{c^2-u' \cdot u}$
36.	$\frac{1}{f}=\left(\frac{n_2}{n_1}-1\right)\left(\frac{1}{r_1}+\frac{1}{r_2}\right)$	n_2, r_1	$n_2=n_1\left[\frac{r_1 r_2}{f\left(r_1+r_2\right)}+1\right]; r_1=\frac{n_1 n_2-f\left(n_2-n_1\right)}{r_2 f\left(n_2-n_1\right)}$

37.	$s = s_0 + v_0\, t + \frac{1}{2} a\, t^2$	a, v_0	$a = 2\frac{\left(s - s_0 - v_0\, t\right)}{t^2}; v_0 = \frac{s - s_0}{t} - \frac{1}{2} a\, t$
38.	$a = \sqrt{h\left(d - h\right)}$	d	$d = \frac{a^2}{h} + h$
39.	$m_1 v_1 + m_2 v_2 = \left(m_1 + m_2\right) v$	m_1	$m_1 = \frac{m_2\left(v_2 - v\right)}{v - v_1}$
40.	$a = g\left(\sin\alpha - f\cos\alpha\right)$	f	$f = tg\,\alpha - \frac{a}{g\cos\alpha}$
41.	$v = \sqrt{\frac{2\left(m\, g\, p - F\right)}{C\, S\, \rho}}$	S, g	$S = \frac{2\left(m\, g\, p - F\right)}{S \rho v^2}; g = \frac{v^2 C\, S \rho}{2\, m\, p} + \frac{F}{m\, p}$
42.	$\cos\alpha = \sqrt{1 - p^2}$	p	$p = \sqrt{1 - \cos^2\alpha}$
43.	$F - m\, g = m\frac{v^2}{r}$	m, v	$m = \frac{F\, r}{v^2 + gr}; v = \sqrt{\frac{F\, r}{m} - g\, r}$
44.	$\frac{\frac{M}{2R} - K}{Q} = J$	R	$R = \frac{M}{2\left(Q \cdot J + K\right)}$
45.	$S = 2\pi\, r\left(r + v\right)$	v	$v = \frac{S - 2 \cdot \pi \cdot r^2}{2 \cdot \pi \cdot r}$
46.	$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$	v, c	$v = c\sqrt{1 + \frac{m_0^2}{m^2}}; c = \frac{m\, v}{\sqrt{m_0^2 + m^2}}$
47.	$F = k\frac{Q_1 Q_2}{r^2}$	Q_1, r	$Q_1 = \frac{F\, r^2}{k\, Q_2}; r = \sqrt{k\frac{Q_1 Q_2}{F}}$
48.	$t = \frac{m_1 t_1 + m_2 t_2}{m_1 + m_2}$	t_1, m_2	$t_1 = \frac{t\left(m_1 + m_2\right) - m_2 t_2}{m_1}; m_2 = m_1\frac{t - t_1}{t_2 - t}$
49.	$B = \mu\frac{N\, I}{l}$	N, I, l	$N = \frac{B\, l}{\mu\, I}; I = \frac{B\, l}{\mu\, N}; l = \mu\frac{N\, I}{B}$
50.	$a_g = \kappa\frac{m}{\left(R + h\right)^2}$	h	$h = \sqrt{\kappa\frac{m}{a_g}} - R$
51.	$W = R \cdot I^2 \cdot t$	I	$I = \sqrt{\frac{W}{R\, t}}$
52.	$N_2 : N_1 = U_2 : U_1$	N_1, U_2	$N_1 = U_1\frac{N_2}{U_2}; U_2 = U_1\frac{N_2}{N_1}$
53.	$a = \frac{v - v_0}{t}$	v_0	$v_0 = v - a\, t$
54.	$h = v_0 \cdot t - \frac{1}{2} g \cdot t^2$	v_0, g	$v_0 = \frac{h}{t} + \frac{1}{2} g t; g = \frac{2\left(v_0\, t - h\right)}{t^2}$
55.	$v_2 = \sqrt{2g\, h_1 - 2g\, h_2 + v_1^2}$	v_1, h_2	$v_1 = \sqrt{v_2^2 - 2gh_1 + 2gh_2}; h_2 = \frac{v_1^2 - v_2^2}{2g} + h_1$

56.	$a_d = \dfrac{(2\pi r f)^2}{r}$	r, f	$r = \dfrac{a_d}{(2\pi f)^2}$; $f = \dfrac{1}{2\pi}\sqrt{\dfrac{a_d}{r}}$
57.	$a = \dfrac{\sqrt{F_1^2 + F_2^2}}{m}$	F_1	$F_1 = \sqrt{(a m)^2 - F_2^2}$
58.	$F = m(p g + a)$	a, g	$a = \dfrac{F}{m} - p g$; $g = \dfrac{F}{p m} - \dfrac{a}{p}$
59.	$F = m\left(g - \dfrac{2s}{t^2}\right)$	s, t	$s = \dfrac{t^2}{2}\left(g - \dfrac{F}{m}\right)$; $t = \sqrt{\dfrac{2 s m}{g m - F}}$
60.	$F = \dfrac{m_1 m_2}{m_1 + m_2} g$	m_2	$m_2 = \dfrac{F m_1}{m_1 g - F}$
61.	$t = \sqrt{\dfrac{h}{g} \cdot \dfrac{m_1 + m_2}{m_2 - m_1}}$	g, m_1	$g = \dfrac{h}{t^2} \cdot \dfrac{m_1 + m_2}{m_2 - m_1}$; $m_1 = m_2 \dfrac{t^2 g - h}{t^2 g + h}$
62.	$t = \dfrac{1}{\sin\beta}\sqrt{\dfrac{2h}{g}}$	h, g	$h = \dfrac{g t^2 \sin^2\beta}{2}$; $g = \dfrac{1}{\sin^2\beta} \cdot \dfrac{2h}{t^2}$
63.	$v_1 = \dfrac{(m_1 + m_2)v - m_2 \cdot v_2}{m_1}$	v_2, m_2	$v_2 = \dfrac{(m_1 + m_2)v - m_1 v_1}{m_2}$; $m_2 = m_1 \dfrac{v_1 - v}{v - v_2}$
64.	$f = \dfrac{1}{2\pi}\sqrt{\dfrac{g \cdot tg\alpha}{d + l \cdot \sin\alpha}}$	g, l	$g = \dfrac{(2\pi f)^2 (d + l \cdot \sin\alpha)}{tg\alpha}$; $l = \dfrac{1}{\sin\alpha}\left(\dfrac{g \cdot tg\alpha}{4\pi^2 f^2} - d\right)$
65.	$\eta = \dfrac{m g h}{P_0 t}$	h, t	$h = \dfrac{\eta P_0 t}{m g}$; $t = \dfrac{m g h}{P_0 \eta}$
66.	$W = fmgs + \dfrac{1}{2} m v^2$	m, v, s	$m = \dfrac{2 \cdot W}{2 fgs + v^2}$; $v = \sqrt{\dfrac{2W}{m} - 2 fgs}$; $s = \dfrac{1}{fgm}\left(W - \dfrac{1}{2} m v^2\right)$
67.	$s = \dfrac{m^2 v_0^2}{2 fg (M + m)^2}$	f, v_0	$f = \dfrac{m^2 v_0^2}{2sg(M + m)^2}$; $v_0 = \dfrac{(M + m)\sqrt{2 fgs}}{m}$
68.	$d = \sqrt{h(2r - h)}$	r	$r = \dfrac{d^2 + h^2}{2h}$
69.	$V_0 = V\left(1 - \dfrac{\rho}{2\rho_z}\right)$	ρ, ρ_z	$\rho = \rho_z\left(1 - \dfrac{V_0}{V}\right)$; $\rho_z = \dfrac{\rho \cdot V}{V - V_0}$
70.	$m = \dfrac{V \rho a}{a + g}$	a, g, ρ	$a = \dfrac{mg}{V\rho - m}$; $\rho = \dfrac{m(a + g)}{V \cdot a}$; $\rho = \dfrac{m(a + g)}{Va}$
71.	$\lambda = \dfrac{hc}{E_n - E_m}$	c, E_m	$c = \dfrac{\lambda(E_n - E_m)}{h}$; $E_m = \dfrac{\lambda \cdot E_n - hc}{\lambda}$
72.	$v = \sqrt{\dfrac{2(hc - \lambda \cdot W)}{\lambda \cdot m}}$	W, m	$m = \dfrac{2(hc - \lambda \cdot W)}{\lambda \cdot v^2}$; $W = \dfrac{2hc - \lambda \cdot v^2 \cdot m}{2 \cdot \lambda}$
73.	$d = \dfrac{(2k + 1)\lambda}{4n}$	k	$k = \dfrac{4d \cdot n - \lambda}{2 \cdot \lambda}$

74.	$\lambda = \dfrac{4cd}{(2k-1)v}$	c, v, k	$c = \dfrac{\lambda(2k-1)v}{4d}$; $v = \dfrac{4cd}{(2k-1)\lambda}$; $k = \dfrac{4cd + v\lambda}{2v\lambda}$
75.	$\dfrac{1}{a} + \dfrac{1}{f+d} = \dfrac{1}{f}$	a, d	$a = \dfrac{f(f+d)}{d}$; $d = \dfrac{a \cdot f}{a - f} - f$
76.	$\dfrac{1}{f} = (n-1)\left(\dfrac{1}{r_1} + \dfrac{1}{r_2}\right)$	n, r_1	$n = \dfrac{1}{f} \cdot \dfrac{r_1 \cdot r_2}{r_1 + r_2} + 1$; $r_1 = \dfrac{r_2 \cdot f \cdot (n-1)}{r_2 - f(n-1)}$
77.	$\dfrac{1}{f} = \left(\dfrac{n_s}{n_v} - 1\right)\left(\dfrac{1}{r_1} + \dfrac{1}{r_2}\right)$	n_s, n_v	$n_s = \dfrac{n_v}{f} \cdot \dfrac{r_1 \cdot r_2}{r_1 + r_2} + n_v$; $n_v = \dfrac{n_s \cdot f \cdot (r_1 + r_2)}{r_1 \cdot r_2 + f(r_1 + r_2)}$
78.	$a = \dfrac{d - \sqrt{d^2 - 4fd}}{2}$	f	$f = \dfrac{d^2 - (d-2a)^2}{4d}$
79.	$R = R_1\left[1 + \alpha(t - t_1)\right]$	α, t_1	$\alpha = \dfrac{1}{(t-t_1)}\left(\dfrac{R}{R_1} - 1\right)$; $t_1 = t - \dfrac{1}{\alpha}\left(\dfrac{R}{R_1} - 1\right)$
80.	$R' = \rho\dfrac{x}{2S} + \rho\dfrac{l-2x}{S}$	ρ, S	$\rho = \dfrac{2 \cdot S \cdot R'}{x + 2(l-2x)}$; $S = \dfrac{\rho\left[x + 2(l-2x)\right]}{2 \cdot R'}$
81.	$E = \dfrac{m}{Q}\sqrt{\left(\dfrac{v}{t}\right)^2 - g^2}$	v, t, g	$v = t\sqrt{\left(\dfrac{EQ}{m}\right)^2 + g^2}$; $t = \dfrac{m \cdot v}{\sqrt{(EQ)^2 + (gm)^2}}$; $g = \sqrt{\left(\dfrac{v}{t}\right)^2 - \left(\dfrac{EQ}{m}\right)^2}$
82.	$E = k\dfrac{Q_1 + Q_2}{\left(\dfrac{r}{2}\right)^2}$	r, Q_2	$r = 2 \cdot \sqrt{\dfrac{k(Q_1 + Q_2)}{E}}$; $Q_2 = \dfrac{E \cdot r^2}{4k} - Q_1$
83.	$E = k\dfrac{Q}{(r+d)^2}$	d	$d = \sqrt{\dfrac{k \cdot Q}{E}} - r$
84.	$Q = \sqrt{\dfrac{mgr_1^3}{2k\sqrt{l^2 - \left(\dfrac{r_2}{2}\right)^2}}}$	k, r_1, l, r_2	$k = \dfrac{mgr_1^3}{2Q^2\sqrt{l^2 - \left(\dfrac{r_2}{2}\right)^2}}$; $r_1 = \sqrt[3]{\dfrac{2k \cdot Q^2}{mg}\sqrt{l^2 - \left(\dfrac{r_2}{2}\right)^2}}$; $l = \sqrt{\left(\dfrac{mgr_1^3}{2k \cdot Q^2}\right)^2 - \left(\dfrac{r_2}{2}\right)^2}$; $r_2 = 2\sqrt{l^2 - \left(\dfrac{mgr_1^3}{2k \cdot Q^2}\right)^2}$
85.	$tg\alpha = \dfrac{r}{2\sqrt{l^2 - \left(\dfrac{r}{2}\right)^2}}$	l	$l = \sqrt{\left(\dfrac{r}{2 \cdot tg\alpha}\right)^2 + \left(\dfrac{r}{2}\right)^2}$
86.	$k\dfrac{QQ_0}{x^2} = k\dfrac{4QQ_0}{(x-d)^2}$	d	$d = -x$
87.	$tg\,\varphi = \dfrac{\omega \cdot L - \dfrac{1}{\omega \cdot C}}{R}$	L, C	$L = \dfrac{R \cdot tg\,\varphi}{\omega} + \dfrac{1}{\omega^2 \cdot C}$; $C = \dfrac{1}{\omega^2 \cdot L - \omega \cdot R \cdot tg\,\varphi}$

88.	$U=\sqrt{U_R^2+\left(U_L-U_C\right)^2}$	U_R,U_L,U_C	$U_R=\sqrt{U^2-\left(U_L-U_C\right)^2}$; $U_L=\sqrt{U^2-U_R^2}+U_C$; $U_C=U_L-\sqrt{U^2-U_R^2}$
89.	$\sin x=\sqrt{\dfrac{1-\cos x}{2}}$	$\cos x$	$\cos x=1-2\cdot\sin^2 x$
90.	$\left(x-m\right)\left(y-n\right)=-\dfrac{1}{2}a^2$	a,x	$a=\sqrt{-2\left(x-m\right)\left(y-n\right)}$; $x=-\dfrac{1}{2\left(y-n\right)}a^2+m$
91.	$B=Z\,m_p+\left(A-Z\right)m_n-m_j$	m_j,m_n,Z	$m_j=Z\,m_p+\left(A-Z\right)m_n-B$; $m_n=\dfrac{B+m_j-Z\,m_p}{\left(A-Z\right)}$; $Z=\dfrac{B+m_j-Am_n}{m_p-m_n}$
92.	$\cos\alpha=\dfrac{b^2+c^2-a^2}{2\,b\,c}$	a	$a^2=b^2+c^2-2\,b\,c\cdot\cos\alpha$
93.	$\dfrac{\left(x-m\right)^2}{a^2}-\dfrac{\left(y-n\right)^2}{b^2}=1$	a,x,n	$a^2=\dfrac{b^2\left(x-m\right)^2}{b^2+\left(y-n\right)^2}$
94.	$v_k=\sqrt{\dfrac{3kT}{m_0}}$	k,m_0	$m_0=\dfrac{3kT}{v_k^2}$; $k=\dfrac{v_k^2\cdot m_0}{3T}$
95.	$V=V_1\left[1+\beta\left(t-t_0\right)\right]$	β,t_0	$\beta=\dfrac{1}{\left(t-t_0\right)}\left(\dfrac{V}{V_1}-1\right)$; $t_0=t-\dfrac{1}{\beta}\left(\dfrac{V}{V_1}-1\right)$
96.	$S^2=4\left(ab+bc+ac\right)^2$	b	$b=\dfrac{S-2ac}{2\left(a+c\right)}$
97.	$S=\pi r\left(r+s\right)$	s	$s=\dfrac{S}{\pi r}-r$
98.	Ze soustavy rovnic $v=a\,t$ a $s=\dfrac{1}{2}a\,t^2$ vyjádři: a) t pomocí v,a b) t pomocí s,a c) a pomocí s,v d) t pomocí s,v e) s pomocí a,v f) v pomocí a,s		a) $t=\dfrac{v}{a}$ b) $t=\sqrt{\dfrac{2s}{a}}$ c) $a=\dfrac{v^2}{2s}$ d) $t=\dfrac{2s}{v}$ e) $s=\dfrac{v^2}{2a}$ f) $v=\sqrt{2as}$
99.	Ze soustavy rovnic $v=v_0+a\,t$ a $s=v_0\,t+\dfrac{1}{2}a\,t^2$ vyjádři: a) t pomocí v,v_0,a b) v_0 pomocí t,s,a		a) $t=\dfrac{v-v_0}{a}$ b) $v_0=\dfrac{s}{t}-\dfrac{1}{2}at$

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