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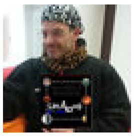

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List of mathematical constants

A mathematical constant is a key number whose value is fixed by an unambiguous definition, often referred to by a symbol (e.g., an alphabet letter), or by mathematicians' names to facilitate using it across multiple mathematical problems.[1] For example, the constant π may be defined as the ratio of the length of a circle's circumference to its diameter. The following list includes a decimal expansion and set containing each number, ordered by year of discovery.

The column headings may be clicked to sort the table alphabetically, by decimal value, or by set. Explanations of the symbols in the right hand column can be found by clicking on them.

List

Name	Symbol	Decimal expansion	Formula	Year	Set		
					$\mathbb{Q}$	$\mathbb{A}$	$\mathcal{P}$
One	1	1	Multiplicative identity of $\mathbb{C}$.	Prehistory	✓	✓	✓
Two	2	2		Prehistory	✓	✓	✓
One half	1/2	0.5		Prehistory	✓	✓	✓
Pi	π	3.14159 26535 89793 23846 [Mw 1][OEIS 1]	Ratio of a circle's circumference to its diameter.	1900 to 1600 BCE [2]	✗	✗	✓
Tau	τ	6.28318 53071 79586 47692[3][OEIS 2]	Ratio of a circle's circumference to its radius. Equivalent to 2π	1900 to 1600 BCE [2]	✗	✗	✓
Square root of 2, Pythagoras constant.[4]	$\sqrt{2}$	1.41421 35623 73095 04880 [Mw 2][OEIS 3]	Positive root of $x^2 = 2$	1800 to 1600 BCE[5]	✗	✓	✓
Square root of 3, Theodorus' constant[6]	$\sqrt{3}$	1.73205 08075 68877 29352 [Mw 3][OEIS 4]	Positive root of $x^2 = 3$	465 to 398 BCE	✗	✓	✓
Square root of 5[7]	$\sqrt{5}$	2.23606 79774 99789 69640 [OEIS 5]	Positive root of $x^2 = 5$		✗	✓	✓
Phi, Golden ratio[8]	φ or ϕ	1.61803 39887 49894 84820 [Mw 4][OEIS 6]	$\frac{1+\sqrt{5}}{2}$	~300 BCE	✗	✓	✓
Silver ratio[9]	δ_S	2.41421 35623 73095 04880 [Mw 5][OEIS 7]	$\sqrt{2}+1$	~300 BCE	✗	✓	✓
Zero	0	0	Additive identity of $\mathbb{C}$.	300 to 100 BCE[10]	✓	✓	✓
Negative one	−1	−1		300 to 200 BCE	✓	✓	✓
Cube root of 2	$\sqrt[3]{2}$	1.25992 10498 94873 16476 [Mw 6][OEIS 8]	Real root of $x^3 = 2$	46 to 120 CE[11]	✗	✓	✓
Cube root of 3	$\sqrt[3]{3}$	1.44224 95703 07408 38232 [OEIS 9]	Real root of $x^3 = 3$		✗	✓	✓
Twelfth root of 2[12]	$\sqrt[12]{2}$	1.05946 30943 59295 26456 [OEIS 10]	Real root of $x^{12} = 2$		✗	✓	✓
Supergolden ratio[13]	ψ	1.46557 12318 76768 02665 [OEIS 11]	$\frac{1+\sqrt[3]{\frac{29+3\sqrt{93}}{2}}+\sqrt[3]{\frac{29-3\sqrt{93}}{2}}}{3}$ Real root of $x^3 = x^2 + 1$		✗	✓	✓
Imaginary unit[14]	i	$0 + 1i$	Principal root of $x^2 = -1$ [nb 1]	1501 to 1576	✗	✓	✓
Connective constant for the hexagonal lattice[15][16]	μ	1.84775 90650 22573 51225 [Mw 7][OEIS 12]	$\sqrt{2+\sqrt{2}}$, as a root of the polynomial $x^4 - 4x^2 + 2 = 0$	1593 [OEIS 12]	✗	✓	✓
Kepler–Bouwkamp constant[17]	K'	0.11494 20448 53296 20070 [Mw 8][OEIS 13]	$\prod_{n=3}^{\infty}\cos\left(\frac{\pi}{n}\right) = \cos\left(\frac{\pi}{3}\right)\cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{5}\right)\ldots$	1596 [OEIS 13]	?	?	?
Wallis's constant		2.09455 14815 42326 59148 [Mw 9][OEIS 14]	$\sqrt[3]{\frac{45-\sqrt{1929}}{18}}+\sqrt[3]{\frac{45+\sqrt{1929}}{18}}$ Real root of $x^3 - 2x - 5 = 0$	1616 to 1703	✗	✓	✓
Euler's number[18]	e	2.71828 18284 59045 23536 [Mw 10][OEIS 15]	$\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n = \sum_{n=0}^{\infty}\frac{1}{n!} = 1+\frac{1}{1!}+\frac{1}{2!}+\frac{1}{3!}\cdots$	1618[19]	✗	✗	?
Natural logarithm of 2[20]	$\ln 2$	0.69314 71805 59945 30941 [Mw 11][OEIS 16]	Real root of $e^x = 2$ $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n} = \frac{1}{1}-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\cdots$	1619[21] & 1668 [22]	✗	✗	✓
Lemniscate constant[23]	ϖ	2.62205 75542 92119 81046 [Mw 12][OEIS 17]	$2\int_0^1 \frac{dt}{\sqrt{1-t^4}} = \frac{1}{4}\sqrt{\frac{2}{\pi}}\,\Gamma\left(\frac{1}{4}\right)^2$ Ratio of the perimeter of Bernoulli's lemniscate to its diameter.	1718 to 1798	✗	✗	✓

Euler's constant	γ	0.57721 56649 01532 86060 [Mw 13][OEIS 18]	$\lim_{n\to\infty}\left(-\log n+\sum_{k=1}^{n}\frac{1}{k}\right)=\int_1^\infty\left(-\frac{1}{x}+\frac{1}{\lfloor x\rfloor}\right)dx$ Limiting difference between the harmonic series and the natural logarithm.	1735	?	?	?
Erdős–Borwein constant[24]	E	1.60669 51524 15291 76378 [Mw 14][OEIS 19]	$\sum_{n=1}^{\infty}\frac{1}{2^n-1}=\frac{1}{1}+\frac{1}{3}+\frac{1}{7}+\frac{1}{15}+\cdots$	1749[25]	✗	?	?
Omega constant	Ω	0.56714 32904 09783 87299 [Mw 15][OEIS 20]	$W(1)=\frac{1}{\pi}\int_0^\pi\log\left(1+\frac{\sin t}{t}e^{t\cot t}\right)dt$ where W is the Lambert W function	1758 & 1783	✗	✗	?
Apéry's constant[26]	$\zeta(3)$	1.20205 69031 59594 28539 [Mw 16][OEIS 21]	$\zeta(3)=\sum_{n=1}^{\infty}\frac{1}{n^3}=\frac{1}{1^3}+\frac{1}{2^3}+\frac{1}{3^3}+\frac{1}{4^3}+\frac{1}{5^3}+\cdots$ with the Riemann zeta function $\zeta(s)$.	1780 [OEIS 21]	✗	?	✓
Laplace limit[27]		0.66274 34193 49181 58097 [Mw 17][OEIS 22]	Real root of $\frac{xe^{\sqrt{x^2+1}}}{\sqrt{x^2+1}+1}=1$	~1782	?	?	?
Soldner constant[28][29]	μ	1.45136 92348 83381 05028 [Mw 18][OEIS 23]	$\mathrm{li}(x)=\int_0^x\frac{dt}{\ln t}=0$; root of the logarithmic integral function.	1792 [OEIS 23]	?	?	?
Gauss's constant[30]	G	0.83462 68416 74073 18628 [Mw 19][OEIS 24]	$\frac{1}{\mathrm{agm}(1,\sqrt{2})}=\frac{1}{4\pi}\sqrt{\frac{2}{\pi}}\Gamma\left(\frac{1}{4}\right)^2=\frac{\varpi}{\pi}$ where *agm* is the arithmetic–geometric mean and ϖ is the lemniscate constant.	1799[31]	✗	✗	?
Second Hermite constant[32]	γ_2	1.15470 05383 79251 52901 [Mw 20][OEIS 25]	$\frac{2}{\sqrt{3}}$	1822 to 1901	✗	✓	✓
Liouville's constant[33]	L	0.11000 10000 00000 00000 0001 [Mw 21][OEIS 26]	$\sum_{n=1}^{\infty}\frac{1}{10^{n!}}=\frac{1}{10^{1!}}+\frac{1}{10^{2!}}+\frac{1}{10^{3!}}+\frac{1}{10^{4!}}+\cdots$	Before 1844	✗	✗	?
First continued fraction constant	C_1	0.69777 46579 64007 98201 [Mw 22][OEIS 27]	$C_2=[0;1,2,3,4,5,\ldots]=\frac{I_1(2)}{I_0(2)}$, (see Bessel functions). $C_2\notin\mathbb{A}$.[34]	1855[35]	✗	✗	?
Ramanujan's constant[36]		262 53741 26407 68743 .99999 99999 99250 073 [Mw 23][OEIS 28]	$e^{\pi\sqrt{163}}$	1859	✗	✗	?
Glaisher–Kinkelin constant	A	1.28242 71291 00622 63687 [Mw 24][OEIS 29]	$e^{\frac{1}{12}-\zeta'(-1)}=e^{\frac{1}{8}-\frac{1}{2}\sum_{n=0}^{\infty}\frac{1}{n+1}\sum_{k=0}^{n}(-1)^k\binom{n}{k}(k+1)^2\ln(k+1)}$	1860 [OEIS 29]	?	?	?
Catalan's constant[37][38][39]	G	0.91596 55941 77219 01505 [Mw 25][OEIS 30]	$\beta(2)=\sum_{n=0}^{\infty}\frac{(-1)^n}{(2n+1)^2}=\frac{1}{1^2}-\frac{1}{3^2}+\frac{1}{5^2}-\frac{1}{7^2}+\frac{1}{9^2}+\cdots$ with the Dirichlet beta function $\beta(s)$.	1864	?	?	✓
Dottie number[40]		0.73908 51332 15160 64165 [Mw 26][OEIS 31]	Real root of $\cos x=x$	1865 [Mw 26]	✗	✗	?
Meissel–Mertens constant[41]	M	0.26149 72128 47642 78375 [Mw 27][OEIS 32]	$\lim_{n\to\infty}\left(\sum_{p\le n}\frac{1}{p}-\ln\ln n\right)=\gamma+\sum_{p}\left(\ln\left(1-\frac{1}{p}\right)+\frac{1}{p}\right)$ where *γ* is the Euler–Mascheroni constant and *p* is prime	1866 & 1873	?	?	?
Universal parabolic constant[42]	P	2.29558 71493 92638 07403 [Mw 28][OEIS 33]	$\ln(1+\sqrt{2})+\sqrt{2}\ =\ \mathrm{arsinh}(1)+\sqrt{2}$	Before 1891[43]	✗	✗	✓
Cahen's constant[44]	C	0.64341 05462 88338 02618 [Mw 29][OEIS 34]	$\sum_{k=1}^{\infty}\frac{(-1)^k}{s_k-1}=\frac{1}{1}-\frac{1}{2}+\frac{1}{6}-\frac{1}{42}+\frac{1}{1806}\pm\cdots$ where s_k is the *k*th term of *Sylvester's sequence* 2, 3, 7, 43, 1807, ...	1891	✗	✗	?
Gelfond's constant[45]	e^π	23.14069 26327 79269 0057 [Mw 30][OEIS 35]	$(-1)^{-i}=i^{-2i}=\sum_{n=0}^{\infty}\frac{\pi^n}{n!}=1+\frac{\pi^1}{1}+\frac{\pi^2}{2}+\frac{\pi^3}{6}+\cdots$	1900[46]	✗	✗	?
Gelfond–Schneider constant[47]	$2^{\sqrt{2}}$	2.66514 41426 90225 18865 [Mw 31][OEIS 36]	$2^{\sqrt{2}}$	Before 1902 [OEIS 36]	✗	✗	?
Second Favard constant[48]	K_2	1.23370 05501 36169 82735 [Mw 32][OEIS 37]	$\frac{\pi^2}{8}=\sum_{n=0}^{\infty}\frac{1}{(2n-1)^2}=\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\frac{1}{7^2}+\cdots$	1902 to 1965	✗	✗	✓
Golden angle[49]	g	2.39996 32297 28653 32223 [Mw 33][OEIS 38]	$\frac{2\pi}{\varphi^2}=\pi(3-\sqrt{5})$ or	1907	✗	✗	✓

			$180(3-\sqrt{5}) = 137.50776\ldots$ in degrees				
Sierpiński's constant[50]	K	2.58498 17595 79253 21706 [Mw 34][OEIS 39]	$\pi\left(2\gamma+\ln\frac{4\pi^3}{\Gamma(\frac{1}{4})^4}\right) = \pi(2\gamma+4\ln\Gamma(\tfrac{3}{4})-\ln\pi)$ $= \pi\left(2\ln 2+3\ln\pi+2\gamma-4\ln\Gamma(\tfrac{1}{4})\right)$	1907	?	?	?
Landau–Ramanujan constant[51]	K	0.76422 36535 89220 66299 [Mw 35][OEIS 40]	$\frac{1}{\sqrt{2}}\prod_{\substack{p\equiv 3 \bmod 4 \\ p \text{ prime}}}\left(1-\frac{1}{p^2}\right)^{-\frac{1}{2}} = \frac{\pi}{4}\prod_{\substack{p\equiv 1 \bmod 4 \\ p \text{ prime}}}\left(1-\frac{1}{p^2}\right)^{\frac{1}{2}}$	1908 [OEIS 40]	?	?	?
First Nielsen–Ramanujan constant[52]	a_1	0.82246 70334 24113 21823 [Mw 36][OEIS 41]	$\frac{\zeta(2)}{2} = \frac{\pi^2}{12} = \sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n^2} = \frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\cdots$	1909	✗	✗	✓
Gieseking constant[53]	G	1.01494 16064 09653 62502 [Mw 37][OEIS 42]	$\frac{3\sqrt{3}}{4}\left(1-\sum_{n=0}^{\infty}\frac{1}{(3n+2)^2}+\sum_{n=1}^{\infty}\frac{1}{(3n+1)^2}\right)$ $= \frac{\sqrt{3}}{3}\left(\frac{\psi_1(1/3)}{2}-\frac{\pi^2}{3}\right)$ with the trigamma function ψ_1.	1912	?	?	✓
Bernstein's constant[54]	β	0.28016 94990 23869 13303 [Mw 38][OEIS 43]	$\lim_{n\to\infty} 2nE_{2n}(f)$, where $E_n(f)$ is the error of the best uniform approximation to a real function $f(x)$ on the interval [−1, 1] by real polynomials of no more than degree n, and $f(x) = \|x\|$	1913	?	?	?
Tribonacci constant[55]		1.83928 67552 14161 13255 [Mw 39][OEIS 44]	$\frac{1+\sqrt[3]{19+3\sqrt{33}}+\sqrt[3]{19-3\sqrt{33}}}{3} = \frac{1+4\cosh\left(\frac{1}{3}\cosh^{-1}\left(2+\frac{3}{8}\right)\right)}{3}$ Real root of $x^3-x^2-x-1=0$	1914 to 1963	✗	✓	✓
Brun's constant[56]	B_2	1.90216 05831 04 [Mw 40][OEIS 45]	$\sum_p\left(\frac{1}{p}+\frac{1}{p+2}\right) = \left(\frac{1}{3}+\frac{1}{5}\right)+\left(\frac{1}{5}+\frac{1}{7}\right)+\left(\frac{1}{11}+\frac{1}{13}\right)+\cdots$ where the sum ranges over all primes p such that $p+2$ is also a prime	1919 [OEIS 45]	?	?	?
Twin primes constant	C_2	0.66016 18158 46869 57392 [Mw 41][OEIS 46]	$\prod_{\substack{p \text{ prime} \\ p\geq 3}}\left(1-\frac{1}{(p-1)^2}\right)$	1922	?	?	?
Plastic ratio[57]	ρ	1.32471 79572 44746 02596 [Mw 42][OEIS 47]	$\sqrt[3]{1+\sqrt[3]{1+\sqrt[3]{1+\cdots}}} = \sqrt[3]{\frac{1}{2}+\frac{\sqrt{69}}{18}}+\sqrt[3]{\frac{1}{2}-\frac{\sqrt{69}}{18}}$ Real root of $x^3 = x+1$	1924 [OEIS 47]	✗	✓	✓
Bloch's constant[58]	B	$0.4332 \leq B \leq 0.4719$ [Mw 43][OEIS 48]	The best known bounds are $\frac{\sqrt{3}}{4}+2\times 10^{-4} \leq B \leq \sqrt{\frac{\sqrt{3}-1}{2}}\cdot\frac{\Gamma(\frac{1}{3})\Gamma(\frac{11}{12})}{\Gamma(\frac{1}{4})}$	1925 [OEIS 48]	?	?	?
Z score for the 97.5 percentile point[59][60][61][62]	$z_{.975}$	1.95996 39845 40054 23552 [Mw 44][OEIS 49]	$\sqrt{2}\,\mathrm{erf}^{-1}(0.95)$ where $\mathrm{erf}^{-1}(x)$ is the inverse error function Real number z such that $\frac{1}{\sqrt{2\pi}}\int_{-\infty}^{z} e^{-x^2/2}\,\mathrm{d}x = 0.975$	1925	?	?	?
Landau's constant[58]	L	$0.5 < L \leq 0.54326$ [Mw 45][OEIS 50]	The best known bounds are $0.5 < L \leq \frac{\Gamma(\frac{1}{3})\Gamma(\frac{5}{6})}{\Gamma(\frac{1}{6})}$	1929	?	?	?
Landau's third constant[58]	A	$0.5 < A \leq 0.7853$		1929	?	?	?
Prouhet–Thue–Morse constant[63]	τ	0.41245 40336 40107 59778 [Mw 46][OEIS 51]	$\sum_{n=0}^{\infty}\frac{t_n}{2^{n+1}} = \frac{1}{4}\left[2-\prod_{n=0}^{\infty}\left(1-\frac{1}{2^{2^n}}\right)\right]$ where t_n is the n^{th} term of the Thue–Morse sequence	1929 [OEIS 51]	✗	✗	?
Golomb–Dickman constant[64]	λ	0.62432 99885 43550 87099 [Mw 47][OEIS 52]	$\int_0^1 e^{\mathrm{Li}(t)}\,dt = \int_0^{\infty}\frac{\rho(t)}{t+2}\,dt$ where $\mathrm{Li}(t)$ is the logarithmic integral, and $\rho(t)$ is the Dickman function	1930 & 1964	?	?	?
Constant related to the asymptotic behavior of Lebesgue constants[65]	c	0.98943 12738 31146 95174 [Mw 48][OEIS 53]	$\lim_{n\to\infty}\left(L_n-\frac{4}{\pi^2}\ln(2n+1)\right) = \frac{4}{\pi^2}\left(-\frac{\Gamma'(\frac{1}{2})}{\Gamma(\frac{1}{2})}+\sum_{k=1}^{\infty}\frac{2\ln k}{4k^2-1}\right)$	1930 [Mw 48]	?	?	?
Feller–Tornier constant[66]	$\mathcal{C}_{FT}$	0.66131 70494 69622 33528 [Mw 49][OEIS 54]	$\frac{1}{2}\prod_{p \text{ prime}}\left(1-\frac{2}{p^2}\right)+\frac{1}{2} = \frac{3}{\pi^2}\prod_{p \text{ prime}}\left(1-\frac{1}{p^2-1}\right)+\frac{1}{2}$	1932	?	?	?
Base 10 Champernowne constant[67]	C_{10}	0.12345 67891 01112 13141 [Mw 50][OEIS 55]	Defined by concatenating representations of successive integers: 0.1 2 3 4 5 6 7 8 9 10 11 12 13 14 ...	1933	✗	✗	?

Salem constant[68]	σ_{10}	1.17628 08182 59917 50654 [Mw 51][OEIS 56]	Largest real root of $x^{10}+x^9-x^7-x^6-x^5-x^4-x^3+x+1=0$	1933 [OEIS 56]	✗	✓	✓
Khinchin's constant[69]	K_0	2.68545 20010 65306 44530 [Mw 52][OEIS 57]	$\prod_{n=1}^{\infty}\left[1+\frac{1}{n(n+2)}\right]^{\log_2(n)}$	1934	?	?	?
Lévy's constant (1)[70]	β	1.18656 91104 15625 45282 [Mw 53][OEIS 58]	$\frac{\pi^2}{12\ln 2}$	1935	?	?	?
Lévy's constant (2)[71]	e^β	3.27582 29187 21811 15978 [Mw 54][OEIS 59]	$e^{\pi^2/(12\ln 2)}$	1936	?	?	?
Copeland–Erdős constant[72]	$\mathcal{C}_{CE}$	0.23571 11317 19232 93137 [Mw 55][OEIS 60]	Defined by concatenating representations of successive prime numbers: 0.2 3 5 7 11 13 17 19 23 29 31 37 ...	1946 [OEIS 60]	✗	?	?
Mills' constant[73]	A	1.30637 78838 63080 69046 [Mw 56][OEIS 61]	Smallest positive real number *A* such that $\lfloor A^{3^n}\rfloor$ is prime for all positive integers *n*	1947	?	?	?
Gompertz constant[74]	δ	0.59634 73623 23194 07434 [Mw 57][OEIS 62]	$\int_0^\infty \frac{e^{-x}}{1+x}\,dx=\int_0^1\frac{dx}{1-\ln x}=\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{2}{1+\cfrac{2}{1+\cfrac{3}{1+3/\cdots}}}}}}$	Before 1948 [OEIS 62]	?	?	?
de Bruijn–Newman constant	Λ	$0\le\Lambda\le 0.2$	The number Λ such that $H(\lambda,z)=\int_0^\infty e^{\lambda u^2}\Phi(u)\cos(zu)du$ has real zeros if and only if λ ≥ Λ. where $\Phi(u)=\sum_{n=1}^{\infty}(2\pi^2n^4e^{9u}-3\pi n^2e^{5u})e^{-\pi n^2e^{4u}}$.	1950	?	?	?
Van der Pauw constant	$\frac{\pi}{\ln 2}$	4.53236 01418 27193 80962 [OEIS 63]	$\frac{\pi}{\ln 2}$	Before 1958 [OEIS 64]	✗	?	?
Magic angle[75]	θ_m	0.95531 66181 245092 78163 [OEIS 65]	$\arctan\sqrt{2}=\arccos\frac{1}{\sqrt{3}}\approx 54.7356°$	Before 1959 [76][75]	✗	✗	✓
Artin's constant[77]	C_{Artin}	0.37395 58136 19202 28805 [Mw 58][OEIS 66]	$\prod_{p\text{ prime}}\left(1-\frac{1}{p(p-1)}\right)$	Before 1961 [OEIS 66]	?	?	?
Porter's constant[78]	C	1.46707 80794 33975 47289 [Mw 59][OEIS 67]	$\frac{6\ln 2}{\pi^2}\left(3\ln 2+4\gamma-\frac{24}{\pi^2}\zeta'(2)-2\right)-\frac{1}{2}$ where *γ* is the Euler–Mascheroni constant and ζ '(2) is the derivative of the Riemann zeta function evaluated at *s* = 2	1961 [OEIS 67]	?	?	?
Lochs constant[79]	L	0.97027 01143 92033 92574 [Mw 60][OEIS 68]	$\frac{6\ln 2\ln 10}{\pi^2}$	1964	?	?	?
DeVicci's tesseract constant		1.00743 47568 84279 37609 [OEIS 69]	The largest cube that can pass through in an 4D hypercube. Positive root of $4x^8-28x^6-7x^4+16x^2+16=0$	1966 [OEIS 69]	✗	✓	✓
Lieb's square ice constant[80]		1.53960 07178 39002 03869 [Mw 61][OEIS 70]	$\left(\frac{4}{3}\right)^{\frac{3}{2}}=\frac{8}{3\sqrt{3}}$	1967	✗	✓	✓
Niven's constant[81]	C	1.70521 11401 05367 76428 [Mw 62][OEIS 71]	$1+\sum_{n=2}^{\infty}\left(1-\frac{1}{\zeta(n)}\right)$	1969	?	?	?
Stephens' constant[82]		0.57595 99688 92945 43964 [Mw 63][OEIS 72]	$\prod_{p\text{ prime}}\left(1-\frac{p}{p^3-1}\right)$	1969 [OEIS 72]	?	?	?
Regular paperfolding sequence[83][84]	P	0.85073 61882 01867 26036 [Mw 64][OEIS 73]	$\sum_{n=0}^{\infty}\frac{8^{2^n}}{2^{2^{n+2}}-1}=\sum_{n=0}^{\infty}\frac{\frac{1}{2^{2^n}}}{1-\frac{1}{2^{2^{n+2}}}}$	1970 [OEIS 73]	✗	✗	?
Reciprocal Fibonacci constant[85]	ψ	3.35988 56662 43177 55317 [Mw 65][OEIS 74]	$\sum_{n=1}^{\infty}\frac{1}{F_n}=\frac{1}{1}+\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{5}+\frac{1}{8}+\frac{1}{13}+\cdots$ where F_n is the n^{th} Fibonacci number	1974 [OEIS 74]	✗	?	?
Chvátal–Sankoff constant for the binary alphabet	γ_2	$0.788071\le\gamma_2\le 0.826280$	$\lim_{n\to\infty}\frac{\mathrm{E}[\lambda_{n,2}]}{n}$ where $\mathrm{E}[\lambda_{n,2}]$ is the expected longest common subsequence of two random length-*n* binary strings	1975	?	?	?
Feigenbaum constant δ[86]	δ	4.66920 16091 02990 67185 [Mw 66][OEIS 75]	$\lim_{n\to\infty}\frac{a_{n+1}-a_n}{a_{n+2}-a_{n+1}}$	1975	?	?	?

			where the sequence a_n is given by n-th period-doubling bifurcation of logistic map $x_{k+1} = ax_k(1-x_k)$ or any other one-dimensional map with a single quadratic maximum				
Chaitin's constants[87]	Ω	In general they are uncomputable numbers. But one such number is 0.00787 49969 97812 3844. [Mw 67][OEIS 76]	$\sum_{p\in P} 2^{-\|p\|}$ ▪ p: Halted program ▪ $\|p\|$: Size in bits of program p ▪ P: Domain of all programs that stop.	1975	✗	✗	✗
Robbins constant[88]	$\Delta(3)$	0.66170 71822 67176 23515 [Mw 68][OEIS 77]	$\frac{4+17\sqrt{2}-6\sqrt{3}-7\pi}{105}+\frac{\ln(1+\sqrt{2})}{5}+\frac{2\ln(2+\sqrt{3})}{5}$	1977 [OEIS 77]	✗	✗	✓
Weierstrass constant[89]		0.47494 93799 87920 65033 [Mw 69][OEIS 78]	$\frac{2^{5/4}\sqrt{\pi}\,e^{\pi/8}}{\Gamma(\frac{1}{4})^2}$	Before 1978[90]	✗	✗	?
Fransén–Robinson constant[91]	F	2.80777 02420 28519 36522 [Mw 70][OEIS 79]	$\int_0^\infty \frac{dx}{\Gamma(x)} = e + \int_0^\infty \frac{e^{-x}}{\pi^2+\ln^2 x}\,dx$	1978	?	?	?
Feigenbaum constant α[92]	α	2.50290 78750 95892 82228 [Mw 66][OEIS 80]	Ratio between the width of a tine and the width of one of its two subtines in a bifurcation diagram	1979	?	?	?
Second du Bois-Reymond constant[93]	C_2	0.19452 80494 65325 11361 [Mw 71][OEIS 81]	$\frac{e^2-7}{2} = \int_0^\infty \left\| \frac{d}{dt}\left(\frac{\sin t}{t}\right)^2 \right\| dt - 1$	1983 [OEIS 81]	✗	✗	?
Erdős–Tenenbaum–Ford constant	δ	0.08607 13320 55934 20688 [OEIS 82]	$1-\frac{1+\log\log 2}{\log 2}$	1984	?	?	?
Conway's constant[94]	λ	1.30357 72690 34296 39125 [Mw 72][OEIS 83]	Real root of the polynomial: $x^{71}-x^{69}-2x^{68}-x^{67}+2x^{66}+2x^{65}+x^{64}-x^{63}-x^{62}-x^{61}-x^{60}$ $-x^{59}+2x^{58}+5x^{57}+3x^{56}-2x^{55}-10x^{54}-3x^{53}-2x^{52}+6x^{51}+6x^{50}$ $+x^{49}+9x^{48}-3x^{47}-7x^{46}-8x^{45}-8x^{44}+10x^{43}+6x^{42}+8x^{41}-5x^{40}$ $-12x^{39}+7x^{38}-7x^{37}+7x^{36}+x^{35}-3x^{34}+10x^{33}+x^{32}-6x^{31}-2x^{30}$ $-10x^{29}-3x^{28}+2x^{27}+9x^{26}-3x^{25}+14x^{24}-8x^{23}-7x^{21}+9x^{20}$ $+3x^{19}-4x^{18}-10x^{17}-7x^{16}+12x^{15}+7x^{14}+2x^{13}-12x^{12}-4x^{11}-2x^{10}$ $+5x^9+x^7-7x^6+7x^5-4x^4+12x^3-6x^2+3x-6=0$	1987	✗	✓	✓
Hafner–Sarnak–McCurley constant[95]	σ	0.35323 63718 54995 98454 [Mw 73][OEIS 84]	$\prod_{p \text{ prime}} \left(1-\left(1-\prod_{n\geq 1}\left(1-\frac{1}{p^n}\right)\right)^2\right)$	1991 [OEIS 84]	?	?	?
Backhouse's constant[96]	B	1.45607 49485 82689 67139 [Mw 74][OEIS 85]	$\lim_{k\to\infty}\left\|\frac{q_{k+1}}{q_k}\right\|$ where: $Q(x)=\frac{1}{P(x)}=\sum_{k=1}^\infty q_k x^k$ $P(x)=1+\sum_{k=1}^\infty p_k x^k = 1+2x+3x^2+5x^3+\cdots$ where p_k is the k^{th} prime number	1995	?	?	?
Viswanath constant[97]		1.13198 82487 943 [Mw 75][OEIS 86]	$\lim_{n\to\infty}\|f_n\|^{\frac{1}{n}}$ where $f_n = f_{n-1} \pm f_{n-2}$, where the signs + or − are chosen at random with equal probability 1/2	1997	?	?	?
Komornik–Loreti constant[98]	q	1.78723 16501 82965 93301 [Mw 76][OEIS 87]	Real number q such that $1=\sum_{k=1}^\infty \frac{t_k}{q^k}$, or $\prod_{n=0}^\infty\left(1-\frac{1}{q^{2^n}}\right)+\frac{q-2}{q-1}=0$ where t_k is the k^{th} term of the Thue–Morse sequence	1998	✗	✗	?
Embree–Trefethen constant	$\beta^\star$	0.70258		1999	?	?	?
Heath-Brown–Moroz constant[99]	C	0.00131 76411 54853 17810 [Mw 77][OEIS 88]	$\prod_{p \text{ prime}}\left(1-\frac{1}{p}\right)^7\left(1+\frac{7p+1}{p^2}\right)$	1999 [OEIS 88]	?	?	?
MRB constant[100][101][102]	S	0.18785 96424 62067 12024 [Mw 78][Ow 1][OEIS 89]	$\sum_{n=1}^\infty (-1)^n(n^{1/n}-1) = -\sqrt[1]{1}+\sqrt[2]{2}-\sqrt[3]{3}+\cdots$	1999	?	?	?
Prime constant[103]	ρ	0.41468 25098 51111 66024 [OEIS 90]	$\sum_{p \text{ prime}} \frac{1}{2^p} = \frac{1}{4}+\frac{1}{8}+\frac{1}{32}+\cdots$	1999 [OEIS 90]	✗	?	?
Somos' quadratic recurrence constant[104]	σ	1.66168 79496 33594 12129 [Mw 79][OEIS 91]	$\prod_{n=1}^\infty n^{1/2^n} = \sqrt{1\sqrt{2\sqrt{3\cdots}}} = 1^{1/2}\,2^{1/4}\,3^{1/8}\cdots$	1999 [Mw 79]	?	?	?

Foias constant[105]	α	1.18745 23511 26501 05459 [Mw 80][OEIS 92]	$x_{n+1} = \left(1 + \frac{1}{x_n}\right)^n \text{ for } n = 1, 2, 3, \ldots$ Foias constant is the unique real number such that if $x_1 = \alpha$ then the sequence diverges to infinity.	2000	?	?	?
Logarithmic capacity of the unit disk[106][107]		0.59017 02995 08048 11302[Mw 81][OEIS 93]	$\frac{\Gamma(\frac{1}{4})^2}{4\pi^{3/2}} = \frac{\varpi}{\pi\sqrt{2}}$ where ϖ is the lemniscate constant.	Before 2003 [OEIS 93]	✗	✗	?
Taniguchi constant[82]		0.67823 44919 17391 97803[Mw 82][OEIS 94]	$\prod_{p \text{ prime}} \left(1 - \frac{3}{p^3} + \frac{2}{p^4} + \frac{1}{p^5} - \frac{1}{p^6}\right)$	Before 2005[82]	?	?	?

Mathematical constants sorted by their representations as continued fractions

The following list includes the continued fractions of some constants and is sorted by their representations. Continued fractions with more than 20 known terms have been truncated, with an ellipsis to show that they continue. Rational numbers have two continued fractions; the version in this list is the shorter one. Decimal representations are rounded or padded to 10 places if the values are known.

Name	Symbol	Set	Decimal expansion	Continued fraction	Notes
Zero	0	$\mathbb{Z}$	0.00000 00000	[0;]	
Golomb–Dickman constant	λ		0.62432 99885	[0; 1, 1, 1, 1, 1, 22, 1, 2, 3, 1, 1, 11, 1, 1, 2, 22, 2, 6, 1, 1, …][OEIS 95]	E. Weisstein noted that the continued fraction has an unusually large number of 1s.[Mw 83]
Cahen's constant	C_2	$\mathbb{R}\setminus\mathbb{A}$	0.64341 05463	[0; 1, 1, 1, 2^2, 3^2, 13^2, 129^2, 25298^2, 420984147^2, 269425140741515486^2, …][OEIS 96]	All terms are squares and truncated at 10 terms due to large size. Davison and Shallit used the continued fraction expansion to prove that the constant is transcendental.
Euler–Mascheroni constant	γ		0.57721 56649[108]	[0; 1, 1, 2, 1, 2, 1, 4, 3, 13, 5, 1, 1, 8, 1, 2, 4, 1, 1, 40, 1, …] [108][OEIS 97]	Using the continued fraction expansion, it was shown that if γ is rational, its denominator must exceed 10^{244663}.
First continued fraction constant	C_1	$\mathbb{R}\setminus\mathbb{Q}$	0.69777 46579	[0; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, …]	Equal to the ratio $I_1(2)/I_0(2)$ of modified Bessel functions of the first kind evaluated at 2.
Catalan's constant	G		0.91596 55942[109]	[0; 1, 10, 1, 8, 1, 88, 4, 1, 1, 7, 22, 1, 2, 3, 26, 1, 11, 1, 10, 1, …] [109][OEIS 98]	Computed up to 4 851 389 025 terms by E. Weisstein.[Mw 84]
One half	1/2	$\mathbb{Q}$	0.50000 00000	[0; 2]	
Prouhet–Thue–Morse constant	τ	$\mathbb{R}\setminus\mathbb{A}$	0.41245 40336	[0; 2, 2, 2, 1, 4, 3, 5, 2, 1, 4, 2, 1, 5, 44, 1, 4, 1, 2, 4, 1, …][OEIS 99]	Infinitely many partial quotients are 4 or 5, and infinitely many partial quotients are greater than or equal to 50.[110]
Copeland–Erdős constant	$\mathcal{C}_{CE}$	$\mathbb{R}\setminus\mathbb{Q}$	0.23571 11317	[0; 4, 4, 8, 16, 18, 5, 1, 1, 1, 1, 7, 1, 1, 6, 2, 9, 58, 1, 3, 4, …][OEIS 100]	Computed up to 1 011 597 392 terms by E. Weisstein. He also noted that while the Champernowne constant continued fraction contains sporadic large terms, the continued fraction of the Copeland–Erdős Constant do not exhibit this property.[Mw 85]
Base 10 Champernowne constant	C_{10}	$\mathbb{R}\setminus\mathbb{A}$	0.12345 67891	[0; 8, 9, 1, 149083, 1, 1, 1, 4, 1, 1, 1, 3, 4, 1, 1, 1, 15, 4.57540 × 10^{165}, 6, 1, …] [OEIS 101]	Champernowne constants in any base exhibit sporadic large numbers; the 40th term in C_{10} has 2504 digits.
One	1	$\mathbb{N}$	1.00000 00000	[1;]	
Phi, Golden ratio	φ	$\mathbb{A}$	1.61803 39887[111]	[1; 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, …] [112]	The convergents are ratios of successive Fibonacci numbers.
Brun's constant	B_2		1.90216 05831	[1; 1, 9, 4, 1, 1, 8, 3, 4, 7, 1, 3, 3, 1, 2, 1, 1, 12, 4, 2, 1, …]	The n^{th} roots of the denominators of the n^{th} convergents are close to Khinchin's constant, suggesting that B_2 is irrational. If true, this will prove the twin prime conjecture.[113]
Square root of 2	$\sqrt{2}$	$\mathbb{A}$	1.41421 35624	[1; 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, …]	The convergents are ratios of successive Pell numbers.
Two	2	$\mathbb{N}$	2.00000 00000	[2;]	
Euler's number	e	$\mathbb{R}\setminus\mathbb{A}$	2.71828 18285[114]	[2; 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, …] [115][OEIS 102]	The continued fraction expansion has the pattern [2; 1, 2, 1, 1, 4, 1, ..., 1, 2n, 1, ...].
Khinchin's constant	K_0		2.68545 20011[116]	[2; 1, 2, 5, 1, 1, 2, 1, 1, 3, 10, 2, 1, 3, 2, 24, 1, 3, 2, 3, 1, …] [117][OEIS 103]	For almost all real numbers x, the coefficients of the continued fraction of x have a finite geometric mean known as Khinchin's constant.
Three	3	$\mathbb{N}$	3.00000 00000	[3;]	
Pi	π	$\mathbb{R}\setminus\mathbb{A}$	3.14159 26536	[3; 7, 15, 1, 292, 1, 1, 1, 2, 1, 3, 1, 14, 2, 1, 1, 2, 2, 2, 2, 1, …] [OEIS 104]	The first few convergents (3, 22/7, 333/106, 355/113, ...) are among the best-known and most widely used historical approximations of π.

Sequences of constants

Name	Symbol	Formula	Year	Set
Harmonic number	H_n	$\sum_{k=1}^{n}\frac{1}{k}$	Antiquity	$\mathbb{Q}$
Gregory coefficients	G_n	$\frac{1}{n!}\int_0^1 x(x-1)(x-2)\cdots(x-n+1)\,dx=\int_0^1\binom{x}{n}\,dx$	1670	$\mathbb{Q}$
Bernoulli number	$B_n^{\pm}$	$\frac{t}{2}\left(\coth\frac{t}{2}\pm 1\right)=\sum_{m=0}^{\infty}\frac{B_m^{\pm}t^m}{m!}$	1689	$\mathbb{Q}$
Hermite constants[Mw 86]	γ_n	For a lattice L in Euclidean space $\mathbf{R}^n$ with unit covolume, i.e. vol($\mathbf{R}^n/L$) = 1, let $\lambda_1(L)$ denote the least length of a nonzero element of L. Then $\sqrt{\gamma_n}n$ is the maximum of $\lambda_1(L)$ over all such lattices L.	1822 to 1901	$\mathbb{R}$
Hafner–Sarnak–McCurley constant[118]	$D(n)$	$D(n)=\prod_{k=1}^{\infty}\left\{1-\left[1-\prod_{j=1}^{n}(1-p_k^{-j})\right]^2\right\}$	1883[Mw 87]	$\mathbb{R}$
Stieltjes constants	γ_n	$\frac{(-1)^n n!}{2\pi}\int_0^{2\pi}e^{-nix}\zeta\left(e^{ix}+1\right)dx.$	before 1894	$\mathbb{R}$
Favard constants[48][Mw 88]	K_r	$\frac{4}{\pi}\sum_{n=0}^{\infty}\left(\frac{(-1)^n}{2n+1}\right)^{r+1}=\frac{4}{\pi}\left(\frac{(-1)^{0(r+1)}}{1^r}+\frac{(-1)^{1(r+1)}}{3^r}+\frac{(-1)^{2(r+1)}}{5^r}+\frac{(-1)^{3(r+1)}}{7^r}+\cdots\right)$	1902 to 1965	$\mathbb{R}$
Generalized Brun's Constant[56]	B_n	$\sum_p(\frac{1}{p}+\frac{1}{p+n})$where the sum ranges over all primes p such that p + n is also a prime	1919[OEIS 45]	$\mathbb{R}$

Champernowne constants[67]	C_b	Defined by concatenating representations of successive integers in base b. $C_b = \sum_{n=1}^{\infty} \frac{n}{b^{\left(\sum_{k=1}^{n} \lceil \log_b(k+1) \rceil\right)}}$	1933	$\mathbb{R} \setminus \mathbb{A}$
Lagrange number	$L(n)$	$\sqrt{9 - \frac{4}{{m_n}^2}}$ where m_n is the nth smallest number such that $m^2 + x^2 + y^2 = 3mxy$ has positive (x,y).	before 1957	$\mathbb{A}$
Feller's coin-tossing constants	α_k, β_k	α_k is the smallest positive real root of $x^{k+1} = 2^{k+1}(x-1), \beta_k = \frac{2-\alpha_k}{k+1-k\alpha_k}$	1968	$\mathbb{A}$
Stoneham number	$\alpha_{b,c}$	$\sum_{n=c^k>1} \frac{1}{b^n n} = \sum_{k=1}^{\infty} \frac{1}{b^{c^k} c^k}$ where b,c are coprime integers.	1973	$\mathbb{R} \setminus \mathbb{Q}$
Beraha constants	$B(n)$	$2 + 2\cos\left(\frac{2\pi}{n}\right)$	1974	$\mathbb{A}$
Chvátal–Sankoff constants	γ_k	$\lim_{n\to\infty} \frac{E[\lambda_{n,k}]}{n}$	1975	$\mathbb{R}$
Hyperharmonic number	$H_n^{(r)}$	$\sum_{k=1}^{n} H_k^{(r-1)}$ and $H_n^{(0)} = \frac{1}{n}$	1995	$\mathbb{Q}$
Gregory number	G_x	$\sum_{n=0}^{\infty} (-1)^n \frac{1}{(2n+1)x^{2n+1}}$ for rational x greater than one.	before 1996	$\mathbb{R}$
Metallic mean		$\frac{n + \sqrt{n^2+4}}{2}$	before 1998	$\mathbb{A}$

See also

- Invariant (mathematics)
- Glossary of mathematical symbols
- List of mathematical symbols by subject
- List of numbers
- List of physical constants
- Particular values of the Riemann zeta function
- Physical constant

Notes

1. Both *i* and −*i* are roots of this equation, though neither root is truly "positive" nor more fundamental than the other as they are algebraically equivalent. The distinction between signs of *i* and −*i* is in some ways arbitrary, but a useful notational device. See imaginary unit for more information.

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Further reading

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Science. Section 5: Mathematical Constants — Continued fractions.

External links

- Inverse Symbolic Calculator, Plouffe's Inverter (https://web.archive.org/web/20181030072352/http://isc.carma.newcastle.edu.au/standard)
- Constants – from Wolfram MathWorld (https://mathworld.wolfram.com/topics/Constants.html)
- On-Line Encyclopedia of Integer Sequences (OEIS) (https://oeis.org/wiki/Index_to_OEIS)
- Steven Finch's page of mathematical constants (https://web.archive.org/web/20120912131952/http://www.people.fas.harvard.edu/~sfinch/)
- Xavier Gourdon and Pascal Sebah's page of numbers, mathematical constants and algorithms (http://numbers.computation.free.fr/Constants/constants.html)

List of numbers

This is a list of notable numbers and articles about notable numbers. The list does not contain all numbers in existence as most of the number sets are infinite. Numbers may be included in the list based on their mathematical, historical or cultural notability, but all numbers have qualities that could arguably make them notable. Even the smallest "uninteresting" number is paradoxically interesting for that very property. This is known as the interesting number paradox.

The definition of what is classed as a number is rather diffuse and based on historical distinctions. For example, the pair of numbers (3,4) is commonly regarded as a number when it is in the form of a complex number (3+4i), but not when it is in the form of a vector (3,4). This list will also be categorized with the standard convention of types of numbers.

This list focuses on numbers as mathematical objects and is *not* a list of numerals, which are linguistic devices: nouns, adjectives, or adverbs that *designate* numbers. The distinction is drawn between the *number* five (an abstract object equal to 2+3), and the *numeral* five (the noun referring to the number).

Natural numbers

Natural numbers are a subset of the integers and are of historical and pedagogical value as they can be used for counting and often have ethno-cultural significance (see below). Beyond this, natural numbers are widely used as a building block for other number systems including the integers, rational numbers and real numbers. Natural numbers are those used for counting (as in "there are *six* (6) coins on the table") and ordering (as in "this is the *third* (3rd) largest city in the country"). In common language, words used for counting are "cardinal numbers" and words used for ordering are "ordinal numbers". Defined by the Peano axioms, the natural numbers form an infinitely large set. Often referred to as "the naturals", the natural numbers are usually symbolised by a boldface **N** (or blackboard bold ℕ, Unicode `U+2115` ℕ DOUBLE-STRUCK CAPITAL N).

The inclusion of 0 in the set of natural numbers is ambiguous and subject to individual definitions. In set theory and computer science, 0 is typically considered a natural number. In number theory, it usually is not. The ambiguity can be solved with the terms "non-negative integers", which includes 0, and "positive integers", which does not.

Natural numbers may be used as cardinal numbers, which may go by various names. Natural numbers may also be used as ordinal numbers.

Table of small natural numbers

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108	109
110	111	112	113	114	115	116	117	118	119
120	121	122	123	124	125	126	127	128	129
130	131	132	133	134	135	136	137	138	139
140	141	142	143	144	145	146	147	148	149
150	151	152	153	154	155	156	157	158	159
160	161	162	163	164	165	166	167	168	169
170	171	172	173	174	175	176	177	178	179
180	181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198	199
200	201	202	203	204	205	206	207	208	209
210	211	212	213	214	215	216	217	218	219
220	221	222	223	224	225	226	227	228	229
230	231	232	233	234	235	236	237	238	239
240	241	242	243	244	245	246	247	248	249
250	251	252	253	254	255	256	257	258	259
260	261	262	263	264	265	266	267	268	269
270	271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288	289
290	291	292	293	294	295	296	297	298	299
300	301	302	303	304	305	306	307	308	309
310	311	312	313	314				318	
				400	500	600	700	800	900
	1000	2000	3000	4000	5000	6000	7000	8000	9000
	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
10^5	10^6	10^7	10^8	10^9	10^{12}				
larger numbers, including 10^{100} and $10^{10^{100}}$									

Mathematical significance

Natural numbers may have properties specific to the individual number or may be part of a set (such as prime numbers) of numbers with a particular property.

List of mathematically significant natural numbers

1, the multiplicative identity. Also the only natural number (not including 0) that is not prime or composite. · 2, the base of the binary number system, used in almost all modern computers and information systems. Also the only natural even number to also be prime. · 3, 2^2-1, the first Mersenne prime and first Fermat number. It is the first odd prime, and it is also the 2 bit integer maximum value. · 4, the first composite number. · 5, the sum of the first two primes and only prime which is the sum of 2 consecutive primes. The ratio of the length from the side to a diagonal of a regular pentagon is the golden ratio. · 6, the first of the series of perfect numbers, whose proper factors sum to the number itself. · 9, the first odd number that is composite. · 11, the fifth prime and first palindromic multi-digit number in base 10. · 12, the first sublime number. · 17, the sum of the first 4 prime numbers, and the only prime which is the sum of 4 consecutive primes. · 24, all Dirichlet characters mod *n* are real if and only if *n* is a divisor of 24. · 25, the first centered square number besides 1 that is also a square number. · 27, the cube of 3, the value of 3^3. · 28, the second perfect number. · 30, the smallest sphenic number. · 32, the smallest nontrivial fifth power. · 36, the smallest number which is a perfect power but not a prime power. · 70, the smallest weird number. · 72, the smallest Achilles number. · 108, the second Achilles number. · 255, 2^8 – 1, the smallest perfect totient number that is neither a power of three nor thrice a prime; it is also the largest number that can be represented using an 8-bit unsigned integer. · 341, the smallest base 2 Fermat pseudoprime. · 496, the third perfect number. · 1729, the Hardy–Ramanujan number, also known as the second taxicab number; that is, the smallest positive integer that can be written as the sum of two positive cubes in two different ways.[1] · 8128, the fourth perfect number. · 142857, the smallest base 10 cyclic number. · 9814072356, the largest perfect power that contains no repeated digits in base ten.

Cultural or practical significance

Along with their mathematical properties, many integers have cultural significance[2] or are also notable for their use in computing and measurement. As mathematical properties (such as divisibility) can confer practical utility, there may be interplay and connections between the cultural or practical significance of an integer and its mathematical properties.

List of integers notable for their cultural meanings

- 3, significant in Christianity as the Trinity. Also considered significant in Hinduism (Trimurti, Tridevi). Holds significance in a number of ancient mythologies.
- 4, considered an "unlucky" number in modern China, Japan and Korea due to its audible similarity to the word "death" in their respective languages.
- 7, the number of days in a week, and considered a "lucky" number in Western cultures.
- 8, considered a "lucky" number in Chinese culture due to its aural similarity to the Chinese term for prosperity.
- 12, a common grouping known as a dozen and the number of months in a year, of constellations of the Zodiac and astrological signs and of Apostles of Jesus.
- 13, considered an "unlucky" number in Western superstition. Also known as a "Baker's dozen".[3]
- 17, considered ill-fated in Italy and other countries of Greek and Latin origins.
- 18, considered a "lucky" number due to it being the value for the Hebrew word for life in Jewish numerology.
- 40, considered a significant number in Tengrism and Turkish folklore. Multiple customs, such as those relating to how many days one must visit someone after a death in the family, include the number forty.
- 42, the "answer to the ultimate question of life, the universe, and everything" in the popular 1979 science fiction work *The Hitchhiker's Guide to the Galaxy*.
- 69, a slang term for reciprocal oral sex.
- 86, a slang term that is used in the American popular culture as a transitive verb to mean throw out or get rid of.[4]
- 108, considered sacred by the Dharmic religions. Approximately equal to the ratio of the distance from Earth to Sun and diameter of the Sun.
- 420, a code-term that refers to the consumption of cannabis.
- 666, the number of the beast from the Book of Revelation.
- 786, regarded as sacred in the Muslim Abjad numerology.
- 5040, mentioned by Plato in the *Laws* as one of the most important numbers for the city.

List of integers notable for their use in units, measurements and scales

- 10, the number of digits in the decimal number system.
- 12, the number base for measuring time in many civilizations.
- 14, the number of days in a fortnight.
- 16, the number of digits in the hexadecimal number system.
- 24, number of hours in a day.
- 31, the number of days most months of the year have.
- 60, the number base for some ancient counting systems, such as the Babylonians', and the basis for many modern measuring systems.
- 360, the number of sexagesimal degrees in a full circle.

- 365, the number of days in the common year, while there are 366 days in a leap year of the solar Gregorian calendar.

List of integers notable in computing

- 4, the number of bits in a nibble.
- 8, the number of bits in an octet and usually in a byte.
- 256, The number of possible combinations within 8 bits, or an octet.
- 1024, the number of bytes in a kibibyte, and bits in a kibibit.
- 65535, $2^{16} - 1$, the maximum value of a 16-bit unsigned integer.
- 65536, 2^{16}, the number of possible 16-bit combinations.
- 65537, $2^{16} + 1$, the most popular RSA public key prime exponent in most SSL/TLS certificates on the Web/Internet.
- 16777216, 2^{24}, or 16^6; the hexadecimal "million" (0x1000000), and the total number of possible color combinations in 24/32-bit True Color computer graphics.
- 2147483647, $2^{31} - 1$, the maximum value of a 32-bit signed integer using two's complement representation.
- 9223372036854775807, $2^{63} - 1$, the maximum value of a 64-bit signed integer using two's complement representation.

Classes of natural numbers

Subsets of the natural numbers, such as the prime numbers, may be grouped into sets, for instance based on the divisibility of their members. Infinitely many such sets are possible. A list of notable classes of natural numbers may be found at classes of natural numbers.

Prime numbers

A prime number is a positive integer which has exactly two divisors: 1 and itself.

The first 100 prime numbers are:

Table of first 100 prime numbers

2	3	5	7	11	13	17	19	23	29
31	37	41	43	47	53	59	61	67	71
73	79	83	89	97	101	103	107	109	113
127	131	137	139	149	151	157	163	167	173
179	181	191	193	197	199	211	223	227	229
233	239	241	251	257	263	269	271	277	281
283	293	307	311	313	317	331	337	347	349
353	359	367	373	379	383	389	397	401	409
419	421	431	433	439	443	449	457	461	463
467	479	487	491	499	503	509	521	523	541

Highly composite numbers

A highly composite number (HCN) is a positive integer with more divisors than any smaller positive integer. They are often used in geometry, grouping and time measurement.

The first 20 highly composite numbers are:

1, 2, 4, 6, 12, 24, 36, 48, 60, 120, 180, 240, 360, 720, 840, 1260, 1680, 2520, 5040, 7560

Perfect numbers

A perfect number is an integer that is the sum of its positive proper divisors (all divisors except itself).

The first 10 perfect numbers:

1. 6
2. 28
3. 496
4. 8128
5. 33 550 336
6. 8 589 869 056
7. 137 438 691 328
8. 2 305 843 008 139 952 128
9. 2 658 455 991 569 831 744 654 692 615 953 842 176
10. 191 561 942 608 236 107 294 793 378 084 303 638 130 997 321 548 169 216

Integers

The integers are a set of numbers commonly encountered in arithmetic and number theory. There are many subsets of the integers, including the natural numbers, prime numbers, perfect numbers, etc. Many integers are notable for their mathematical properties. Integers are usually symbolised by a boldface **Z** (or blackboard bold ℤ, Unicode U+2124 ℤ DOUBLE-STRUCK CAPITAL Z); this became the symbol for the integers based on the German word for "numbers" (*Zahlen*).

Notable integers include −1, the additive inverse of unity, and 0, the additive identity.

As with the natural numbers, the integers may also have cultural or practical significance. For instance, −40 is the equal point in the Fahrenheit and Celsius scales.

SI prefixes

One important use of integers is in orders of magnitude. A power of 10 is a number 10^k, where k is an integer. For instance, with k = 0, 1, 2, 3, ..., the appropriate powers of ten are 1, 10, 100, 1000, ... Powers of ten can also be fractional: for instance, k = -3 gives 1/1000, or 0.001. This is used in scientific notation, real numbers are written in the form $m \times 10^n$. The number 394,000 is written in this form as 3.94×10^5.

Integers are used as prefixes in the SI system. A **metric prefix** is a unit prefix that precedes a basic unit of measure to indicate a multiple or fraction of the unit. Each prefix has a unique symbol that is prepended to the unit symbol. The prefix *kilo-*, for example, may be added to *gram* to indicate *multiplication* by one thousand: one kilogram is equal to one thousand grams. The prefix *milli-*, likewise, may be added to *metre* to indicate *division* by one thousand; one millimetre is equal to one thousandth of a metre.

Value	1000^m	Name	Symbol
1 000	1000^1	Kilo	k
1 000 000	1000^2	Mega	M
1 000 000 000	1000^3	Giga	G
1 000 000 000 000	1000^4	Tera	T
1 000 000 000 000 000	1000^5	Peta	P
1 000 000 000 000 000 000	1000^6	Exa	E
1 000 000 000 000 000 000 000	1000^7	Zetta	Z
1 000 000 000 000 000 000 000 000	1000^8	Yotta	Y
1 000 000 000 000 000 000 000 000 000	1000^9	Ronna	R
1 000 000 000 000 000 000 000 000 000 000	1000^{10}	Quetta	Q

Rational numbers

A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, a numerator p and a non-zero denominator q.[5] Since q may be equal to 1, every integer is trivially a rational number. The set of all rational numbers, often referred to as "the rationals", the field of rationals or the field of rational numbers is usually denoted by a boldface **Q** (or blackboard bold $\mathbb{Q}$, Unicode U+211A ℚ DOUBLE-STRUCK CAPITAL Q);[6] it was thus denoted in 1895 by Giuseppe Peano after *quoziente*, Italian for "quotient".

Rational numbers such as 0.12 can be represented in infinitely many ways, e.g. *zero-point-one-two* (0.12), *three twenty-fifths* ($\frac{3}{25}$), *nine seventy-fifths* ($\frac{9}{75}$), etc. This can be mitigated by representing rational numbers in a canonical form as an irreducible fraction.

A list of rational numbers is shown below. The names of fractions can be found at numeral (linguistics).

Table of notable rational numbers

Decimal expansion	Fraction	Notability
1.0	$\frac{1}{1}$	One is the multiplicative identity. One is a rational number, as it is equal to 1/1.
1		
−0.083 333...	$-\frac{1}{12}$	The value assigned to the series 1+2+3... by zeta function regularization and Ramanujan summation.
0.5	$\frac{1}{2}$	One half occurs commonly in mathematical equations and in real world proportions. One half appears in the formula for the area of a triangle: $\frac{1}{2}$ × base × perpendicular height and in the formulae for figurate numbers, such as triangular numbers and pentagonal numbers.
3.142 857...	$\frac{22}{7}$	A widely used approximation for the number π. It can be proven that this number exceeds π.
0.166 666...	$\frac{1}{6}$	One sixth. Often appears in mathematical equations, such as in the sum of squares of the integers and in the solution to the Basel problem.

Real numbers

Real numbers are least upper bounds of sets of rational numbers that are bounded above, or greatest lower bounds of sets of rational numbers that are bounded below, or limits of convergent sequences of rational numbers. real numbers that are not rational numbers are called irrational numbers. The real numbers are categorised as algebraic numbers (which are the root of a polynomial with rational coefficients) or transcendental numbers, which are not; all rational numbers are algebraic.

Algebraic numbers

Name	Expression	Decimal expansion	Notability
Golden ratio conjugate (Φ)	$\frac{\sqrt{5}-1}{2}$	0.618 033 988 749 894 848 204 586 834 366	Reciprocal of (and one less than) the golden ratio.
Twelfth root of two	$\sqrt[12]{2}$	1.059 463 094 359 295 264 561 825 294 946	Proportion between the frequencies of adjacent semitones in the 12 tone equal temperament scale.
Cube root of two	$\sqrt[3]{2}$	1.259 921 049 894 873 164 767 210 607 278	Length of the edge of a cube with volume two. See doubling the cube for the significance of this number.
Conway's constant	(cannot be written as expressions involving integers and the operations of addition, subtraction, multiplication, division, and the extraction of roots)	1.303 577 269 034 296 391 257 099 112 153	Defined as the unique positive real root of a certain polynomial of degree 71. The limit ratio between subsequent numbers in the binary Look-and-say sequence (OEIS: A014715).
Plastic ratio	$\sqrt[3]{\frac{1}{2}+\frac{1}{6}\sqrt{\frac{23}{3}}}+\sqrt[3]{\frac{1}{2}-\frac{1}{6}\sqrt{\frac{23}{3}}}$	1.324 717 957 244 746 025 960 908 854 478	The only real solution of $x^3 = x + 1$. (OEIS: A060006) The limit ratio between subsequent numbers in the Van der Laan sequence. (OEIS: A182097)
Square root of two	$\sqrt{2}$	1.414 213 562 373 095 048 801 688 724 210	$\sqrt{2}$ = 2 sin 45° = 2 cos 45° Square root of two a.k.a. Pythagoras' constant. Ratio of diagonal to side length in a square. Proportion between the sides of paper sizes in the ISO 216 series (originally DIN 476 series).
Supergolden ratio	$\frac{1+\sqrt[3]{\frac{29+3\sqrt{3\cdot 31}}{2}}+\sqrt[3]{\frac{29-3\sqrt{3\cdot 31}}{2}}}{3}$	1.465 571 231 876 768 026 656 731 225 220	The only real solution of $x^3 = x^2 + 1$. (OEIS: A092526) The limit ratio between subsequent numbers in Narayana's cows sequence. (OEIS: A000930)
Triangular root of 2	$\frac{\sqrt{17}-1}{2}$	1.561 552 812 808 830 274 910 704 927 987	
Golden ratio (φ)	$\frac{\sqrt{5}+1}{2}$	1.618 033 988 749 894 848 204 586 834 366	The larger of the two real roots of $x^2 = x + 1$.
Square root of three	$\sqrt{3}$	1.732 050 807 568 877 293 527 446 341 506	$\sqrt{3}$ = 2 sin 60° = 2 cos 30° . A.k.a. *the measure of the fish* or Theodorus' constant. Length of the space diagonal of a cube with edge length 1. Altitude of an equilateral triangle with side length

			2. Altitude of a regular hexagon with side length 1 and diagonal length 2.
Tribonacci constant	$\frac{1+\sqrt[3]{19+3\sqrt{3\cdot 11}}+\sqrt[3]{19-3\sqrt{3\cdot 11}}}{3}$	1.839 286 755 214 161 132 551 852 564 653	The only real solution of $x^3 = x^2 + x + 1$. (OEIS: A058265) The limit ratio between subsequent numbers in the Tribonacci sequence. (OEIS: A000073) Appears in the volume and coordinates of the snub cube and some related polyhedra.
Supersilver ratio	$\frac{2+\sqrt[3]{\frac{43+3\sqrt{3\cdot 59}}{2}}+\sqrt[3]{\frac{43-3\sqrt{3\cdot 59}}{2}}}{3}$	2.205 569 430 400 590 311 702 028 617 78	The only real solution of $x^3 = 2x^2 + 1$. (OEIS: A356035) The limit ratio between subsequent numbers in the third-order Pell sequence. (OEIS: A008998)
Square root of five	$\sqrt{5}$	2.236 067 977 499 789 696 409 173 668 731	Length of the diagonal of a 1 × 2 rectangle.
Silver ratio (δ_S)	$\sqrt{2}+1$	2.414 213 562 373 095 048 801 688 724 210	The larger of the two real roots of $x^2 = 2x + 1$. Altitude of a regular octagon with side length 1.
Bronze ratio (S_3)	$\frac{\sqrt{13}+3}{2}$	3.302 775 637 731 994 646 559 610 633 735	The larger of the two real roots of $x^2 = 3x + 1$.

Transcendental numbers

Name	Symbol or Formula	Decimal expansion	Notes and notability
Gelfond's constant	e^{π}	23.140 692 632 779 25...	
Ramanujan's constant	$e^{\pi\sqrt{163}}$	262 537 412 640 768 743.999 999 999 999 25...	
Gaussian integral	$\sqrt{\pi}$	1.772 453 850 905 516...	
Komornik–Loreti constant	q	1.787 231 650...	
Universal parabolic constant	P_2	2.295 587 149 39...	
Gelfond–Schneider constant	$2^{\sqrt{2}}$	2.665 144 143...	
Euler's number	e	2.718 281 828 459 045 235 360 287 471 352 662 497 757 247...	Raising e to the power of i π will result in -1.
Pi	π	3.141 592 653 589 793 238 462 643 383 279 502 884 197 169 399 375...	Pi is a constant irrational number that is the result of dividing the circumference

			of a circle by its diameter.
Super square-root of 2	$\sqrt{2}_s$[7]	1.559 610 469...[8]	
Liouville constant	L	0.110 001 000 000 000 000 000 001 000...	
Champernowne constant	C_{10}	0.123 456 789 101 112 131 415 16...	This constant contains every number string inside it, as its decimals are just every number in order. (1,2,3,etc.)
Prouhet–Thue–Morse constant	τ	0.412 454 033 640...	
Omega constant	Ω	0.567 143 290 409 783 872 999 968 6622...	
Cahen's constant	C	0.643 410 546 29...	
Natural logarithm of 2	ln 2	0.693 147 180 559 945 309 417 232 121 458	
Lemniscate constant	ϖ	2.622 057 554 292 119 810 464 839 589 891...	The ratio of the perimeter of Bernoulli's lemniscate to its diameter.
Tau	$\tau = 2\pi$	6.283 185 307 179 586 476 925 286 766 559...	The ratio of the circumference to a radius, and the number of radians in a complete circle;[9][10] 2 $\times$ π

Irrational but not known to be transcendental

Some numbers are known to be irrational numbers, but have not been proven to be transcendental. This differs from the algebraic numbers, which are known not to be transcendental.

Name	Decimal expansion	Proof of irrationality	Reference of unknown transcendentality
ζ(3), also known as Apéry's constant	1.202 056 903 159 594 285 399 738 161 511 449 990 764 986 292	[11]	[12]
Erdős–Borwein constant, E	1.606 695 152 415 291 763...	[13][14]	
Copeland–Erdős constant	0.235 711 131 719 232 931 374 143...	Can be proven with Dirichlet's theorem on arithmetic progressions or Bertrand's postulate (Hardy and Wright, p. 113) or Ramare's theorem that every even integer is a sum of at most six primes. It also follows directly from its normality.	
Prime constant, ρ	0.414 682 509 851 111 660 248 109 622...	Proof of the number's irrationality is given at prime constant.	
Reciprocal Fibonacci constant, ψ	3.359 885 666 243 177 553 172 011 302 918 927 179 688 905 133 731...	[15][16]	[17]

Real but not known to be irrational, nor transcendental

For some numbers, it is not known whether they are algebraic or transcendental. The following list includes real numbers that have not been proved to be irrational, nor transcendental.

Name and symbol	Decimal expansion	Notes
Euler–Mascheroni constant, γ	0.577 215 664 901 532 860 606 512 090 082...[18]	Believed to be transcendental but not proven to be so. However, it was shown that at least one of γ and the Euler-Gompertz constant δ is transcendental.[19][20] It was also shown that all but at most one number in an infinite list containing $\frac{\gamma}{4}$ have to be transcendental.[21][22]
Euler–Gompertz constant, δ	0.596 347 362 323 194 074 341 078 499 369...[23]	It was shown that at least one of the Euler-Mascheroni constant γ and the Euler-Gompertz constant δ is transcendental.[19][20]
Catalan's constant, G	0.915 965 594 177 219 015 054 603 514 932 384 110 774...	It is not known whether this number is irrational.[24]
Khinchin's constant, K_0	2.685 452 001...[25]	It is not known whether this number is irrational.[26]
1st Feigenbaum constant, δ	4.6692...	Both Feigenbaum constants are believed to be transcendental, although they have not been proven to be so.[27]
2nd Feigenbaum constant, α	2.5029...	Both Feigenbaum constants are believed to be transcendental, although they have not been proven to be so.[27]
Glaisher–Kinkelin constant, A	1.282 427 12...	
Backhouse's constant	1.456 074 948...	
Fransén–Robinson constant, F	2.807 770 2420...	
Lévy's constant,β	1.18656 91104 15625 45282...	
Mills' constant, A	1.306 377 883 863 080 690 46...	It is not known whether this number is irrational. (Finch 2003)
Ramanujan–Soldner constant, μ	1.451 369 234 883 381 050 283 968 485 892 027 449 493...	
Sierpiński's constant, K	2.584 981 759 579 253 217 065 8936...	
Totient summatory constant	1.339 784...[28]	
Vardi's constant, E	1.264 084 735 305...	
Somos' quadratic recurrence constant, σ	1.661 687 949 633 594 121 296...	
Niven's constant, C	1.705 211...	
Brun's constant, B_2	1.902 160 583 104...	The irrationality of this number would be a consequence of the truth of the infinitude of twin primes.
Landau's totient constant	1.943 596...[29]	
Brun's constant for prime quadruplets, B_4	0.870 588 3800...	
Viswanath's constant	1.131 988 248 7943...	
Khinchin–Lévy constant	1.186 569 1104...[30]	This number represents the probability that three random numbers have no common factor greater than 1.[31]

Landau–Ramanujan constant	0.764 223 653 589 220 662 990 698 731 25...	
C(1)	0.779 893 400 376 822 829 474 206 413 65...	
Z(1)	−0.736 305 462 867 317 734 677 899 828 925 614 672...	
Heath-Brown–Moroz constant, C	0.001 317 641...	
Kepler–Bouwkamp constant,K'	0.114 942 0448...	
MRB constant,S	0.187 859...	It is not known whether this number is irrational.
Meissel–Mertens constant, M	0.261 497 212 847 642 783 755 426 838 608 695 859 0516...	
Bernstein's constant, β	0.280 169 4990...	
Gauss–Kuzmin–Wirsing constant, λ_1	0.303 663 0029...[32]	
Hafner–Sarnak–McCurley constant,σ	0.353 236 3719...	
Artin's constant,C_{Artin}	0.373 955 8136...	
S(1)	0.438 259 147 390 354 766 076 756 696 625 152...	
F(1)	0.538 079 506 912 768 419 136 387 420 407 556...	
Stephens' constant	0.575 959...[33]	
Golomb–Dickman constant, λ	0.624 329 988 543 550 870 992 936 383 100 837 24...	
Twin prime constant, C_2	0.660 161 815 846 869 573 927 812 110 014...	
Feller–Tornier constant	0.661 317...[34]	
Laplace limit, ε	0.662 743 4193...[35]	
Embree–Trefethen constant	0.702 58...	

Numbers not known with high precision

Some real numbers, including transcendental numbers, are not known with high precision.

- The constant in the Berry–Esseen Theorem: $0.4097 < C < 0.4748$
- De Bruijn–Newman constant: $0 \leq \Lambda \leq 0.2$
- Chaitin's constants Ω, which are transcendental and provably impossible to compute.
- Bloch's constant (also 2nd Landau's constant): $0.4332 < B < 0.4719$
- 1st Landau's constant: $0.5 < L < 0.5433$
- 3rd Landau's constant: $0.5 < A \leq 0.7853$
- Grothendieck constant: $1.67 < k < 1.79$
- Romanov's constant in Romanov's theorem: $0.107648 < d < 0.49094093$, Romanov conjectured that it is 0.434

Hypercomplex numbers

Hypercomplex number is a term for an element of a unital algebra over the field of real numbers. The complex numbers are often symbolised by a boldface **C** (or blackboard bold ℂ, Unicode U+2102 ℂ DOUBLE-STRUCK CAPITAL C), while the set of quaternions is denoted by a boldface **H** (or blackboard bold ℍ, Unicode U+210D ℍ DOUBLE-STRUCK CAPITAL H).

Algebraic complex numbers

- Imaginary unit: $i = \sqrt{-1}$
- *n*th roots of unity: $\xi_n^k = \cos\left(2\pi\frac{k}{n}\right) + i\sin\left(2\pi\frac{k}{n}\right)$, while $0 \le k \le n-10$, GCD(*k*, *n*) = 1

Other hypercomplex numbers

- The quaternions
- The octonions
- The sedenions
- The trigintaduonions
- The dual numbers (with an infinitesimal)

Transfinite numbers

Transfinite numbers are numbers that are "infinite" in the sense that they are larger than all finite numbers, yet not necessarily absolutely infinite.

- Aleph-null: $\aleph_0$: the smallest infinite cardinal, and the cardinality of ℕ, the set of natural numbers
- Aleph-one: $\aleph_1$: the cardinality of ω_1, the set of all countable ordinal numbers
- Beth-one: $\beth_1$: the cardinality of the continuum $2^{\aleph_0}$
- ℭ or 𝔠: the cardinality of the continuum $2^{\aleph_0}$
- Omega: ω, the smallest infinite ordinal

Numbers representing physical quantities

Physical quantities that appear in the universe are often described using physical constants.

- Avogadro constant: N_A = 6.022 140 76 × 10^{23} mol^{-1}[36]
- Electron mass: m_e = 9.109 383 7139(28) × 10^{-31} kg[37]
- Fine-structure constant: α = 0.007 297 352 5643(11)[38]
- Gravitational constant: G = 6.674 30(15) × 10^{-11} $\text{m}^3\cdot\text{kg}^{-1}\cdot\text{s}^{-2}$[39]
- Molar mass constant: M_u = 1.000 000 001 05(31) × 10^{-3} $\text{kg}\cdot\text{mol}^{-1}$[40]
- Planck constant: h = 6.626 070 15 × 10^{-34} $\text{J}\cdot\text{Hz}^{-1}$[41]
- Rydberg constant: R_∞ = 10 973 731.568 157(12) m^{-1}[42]
- Speed of light in vacuum: c = 299 792 458 $\text{m}\cdot\text{s}^{-1}$[43]
- Vacuum electric permittivity: ε_0 = 8.854 187 8188(14) × 10^{-12} $\text{F}\cdot\text{m}^{-1}$[44]

Numbers representing geographical and astronomical distances

- 6 378.137, the average equatorial radius of Earth in kilometers (following GRS 80 and WGS 84 standards).
- 40 075.0167, the length of the Equator in kilometers (following GRS 80 and WGS 84 standards).
- 384 399, the semi-major axis of the orbit of the Moon, in kilometers, roughly the distance between the center of Earth and that of the Moon.
- 149 597 870 700, the average distance between the Earth and the Sun or Astronomical Unit (AU), in meters.
- 9 460 730 472 580 800, one light-year, the distance travelled by light in one Julian year, in meters.

- 30 856 775 814 913 673, the distance of one parsec, another astronomical unit, in whole meters.

Numbers without specific values

Many languages have words expressing indefinite and fictitious numbers—inexact terms of indefinite size, used for comic effect, for exaggeration, as placeholder names, or when precision is unnecessary or undesirable. One technical term for such words is "non-numerical vague quantifier".[45] Such words designed to indicate large quantities can be called "indefinite hyperbolic numerals".[46]

Named numbers

- Hardy–Ramanujan number, 1729
- Kaprekar's constant, 6174
- Eddington number, ~10^{80}
- Googol, 10^{100}
- Shannon number
- Centillion, 10^{303}
- Skewes's number
- Googolplex, $10^{(10^{100})}$
- Mega/Circle(2)
- Moser's number
- Graham's number
- TREE(3)
- SSCG(3)
- Rayo's number
- Kanahiya's Constant, 2592

See also

Mathematics portal

- Absolute infinite
- English numerals
- Floating-point arithmetic
- Fraction
- Integer sequence
- Interesting number paradox
- Large numbers
- List of mathematical constants
- List of prime numbers
- List of types of numbers
- Mathematical constant
- Metric prefix
- Names of large numbers
- Names of small numbers
- Negative number
- Numeral (linguistics)
- Numeral prefix
- Order of magnitude
- Orders of magnitude (numbers)
- Ordinal number
- *The Penguin Dictionary of Curious and Interesting Numbers*
- Perfect numbers
- Power of two
- Power of 10
- Surreal number
- Table of prime factors

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Further reading

- *Kingdom of Infinite Number: A Field Guide* by Bryan Bunch, W.H. Freeman & Company, 2001. ISBN 0-7167-4447-3

External links

- What's Special About This Number? A Zoology of Numbers: from 0 to 500 (http://www.archimedes-lab.org/numbers/Num1_69.html)
- Name of a Number (http://www.isthe.com/chongo/tech/math/number/number.html)
- See how to write big numbers (http://www.mathcats.com/explore/reallybignumbers.html)

- About big numbers (https://web.archive.org/web/20101127194324/http://pages.prodigy.net/jhonig/bignum/indx.html) at the Wayback Machine (archived 27 November 2010)
- Robert P. Munafo's Large Numbers page (http://www.mrob.com/pub/math/largenum.html)
- Different notations for big numbers – by Susan Stepney (http://www-users.cs.york.ac.uk/~susan/cyc/b/big.htm)
- Names for Large Numbers (http://www.ibiblio.org/units/large.html), in *How Many? A Dictionary of Units of Measurement* by Russ Rowlett
- What's Special About This Number? (https://erich-friedman.github.io/numbers.html) (from 0 to 9999)

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List of scientific constants named after people

This is a list of physical and mathematical constants named after people.[1] Eponymous constants and their influence on scientific citations have been discussed in the literature.[2][a]

- Apéry's constant – Roger Apéry
- Archimedes' constant (π, pi) – Archimedes
- Avogadro constant – Amedeo Avogadro
- Balmer's constant – Johann Jakob Balmer
- Belphegor's prime – Belphegor (demon)
- Bohr magneton – Niels Bohr
- Bohr radius – Niels Bohr
- Boltzmann constant – Ludwig Boltzmann
- Brun's constant – Viggo Brun
- Cabibbo angle – Nicola Cabibbo
- Chaitin's constant – Gregory Chaitin
- Champernowne constant – D. G. Champernowne
- Chandrasekhar limit – Subrahmanyan Chandrasekhar
- Copeland–Erdős constant – Paul Erdős and Peter Borwein
- Eddington number – Arthur Stanley Eddington
- Dunbar's number – Robin Dunbar
- Embree–Trefethen constant
- Erdős–Borwein constant
- Euler–Mascheroni constant (γ) – Leonhard Euler and Lorenzo Mascheroni
- Euler's number (e) – Leonhard Euler
- Faraday constant – Michael Faraday
- Feigenbaum constants – Mitchell Feigenbaum
- Fermi coupling constant – Enrico Fermi
- Gauss's constant – Carl Friedrich Gauss
- Graham's number – Ronald Graham
- Hartree energy – Douglas Hartree
- Hubble constant – Edwin Hubble
- Josephson constant – Brian David Josephson
- Kaprekar's constant – D. R. Kaprekar
- Kerr constant – John Kerr
- Khinchin's constant – Aleksandr Khinchin
- Landau–Ramanujan constant – Edmund Landau and Srinivasa Ramanujan
- Legendre's constant (one, 1) – Adrien-Marie Legendre
- Loschmidt constant – Johann Josef Loschmidt
- Ludolphsche Zahl – Ludolph van Ceulen
- Mean of Phidias (golden ratio, ϕ, phi) – Phidias

- Meissel–Mertens constant
- Moser's number
- Newtonian constant of gravitation (gravitational constant, G) – Sir Isaac Newton
- Planck constant (h) – Max Planck
    - Reduced Planck constant or Dirac constant (h-bar, $\hbar$) – Max Planck, Paul Dirac
- Ramanujan–Soldner constant – Srinivasa Ramanujan and Johann Georg von Soldner
- Richardson constant – Owen Willans Richardson
- Rayo's number – Agustin Rayo
- Rydberg constant – Johannes Rydberg
- Sommerfeld constant – Arnold Sommerfeld
- Sagan's number – Carl Sagan
- Sackur–Tetrode constant – Otto Sackur and Hugo Tetrode
- Sierpiński's constant – Wacław Sierpiński
- Skewes' number – Stanley Skewes
- Stefan–Boltzmann constant – Jožef Stefan and Ludwig Boltzmann
- Theodorus' constant ($\sqrt{3} \cong \pm 1.732050807568877...$) – Theodorus of Cyrene
- Tupper's number – Jeff Tupper
- Viswanath's constant – Divakar Viswanath
- von Klitzing constant – Klaus von Klitzing
- Wien displacement law constant – Wilhelm Wien

See also

- List of eponymous laws, for a list of laws named after people
- List of scientific laws named after people
- List of scientists whose names are used in physical constants

Notes and references

a. The article addresses the major premise in the argument against the Ortega hypothesis: that citation counts fairly reflect the importance of scientific contributions. It presents the results of a study of eponyms in scientific literature. The result is that usually when a journal paper refers to a unit, constant, technique, device, etc. that is named after a scientist (an "eponym"), that paper will not cite the person who is the namesake of the unit, constant, technique, etc. Early papers cite it more; later papers cite it less.

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Wikipedia
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List of physical constants

The constants listed here are known values of physical constants expressed in SI units; that is, physical quantities that are generally believed to be universal in nature and thus are independent of the unit system in which they are measured. Many of these are redundant, in the sense that they obey a known relationship with other physical constants and can be determined from them.

Table of physical constants

Symbol	Quantity	Value[a][b]	Relative standard uncertainty	Ref[1]
c	speed of light in vacuum	299 792 458 m⋅s^{-1}	0	[2]
h	Planck constant	6.626 070 15 × 10^{-34} J⋅Hz^{-1}	0	[3]
$\hbar = h/2\pi$	reduced Planck constant	1.054 571 817... × 10^{-34} J⋅s	0	[4]
k, k_B	Boltzmann constant	1.380 649 × 10^{-23} J⋅K^{-1}	0	[5]
G	Newtonian constant of gravitation	6.674 30(15) × 10^{-11} m^3⋅kg^{-1}⋅s^{-2}	2.2 × 10^{-5}	[6]
Λ	cosmological constant	1.089(29) × 10^{-52} m^{-2} [c] 1.088(30) × 10^{-52} m^{-2} [d]	0.027 0.028	[7] [8]
$\sigma = \pi^2 k_\mathrm{B}^4/60\hbar^3 c^2$	Stefan–Boltzmann constant	5.670 374 419... × 10^{-8} W⋅m^{-2}⋅K^{-4}	0	[9]
$c_1 = 2\pi hc^2$	first radiation constant	3.741 771 852... × 10^{-16} W⋅m^2	0	[10]
$c_{1\mathrm{L}} = 2hc^2/\mathrm{sr}$	first radiation constant for spectral radiance	1.191 042 972... × 10^{-16} W⋅m^2⋅sr^{-1}	0	[11]
$c_2 = hc/k_\mathrm{B}$	second radiation constant	1.438 776 877... × 10^{-2} m⋅K	0	[12]
b [e]	Wien wavelength displacement law constant	2.897 771 955... × 10^{-3} m⋅K	0	[13]
b' [f]	Wien frequency displacement law constant	5.878 925 757... × 10^{10} Hz⋅K^{-1}	0	[14]
b_entropy	Wien entropy displacement law constant	3.002 916 077... × 10^{-3} m⋅K	0	[15]
e	elementary charge	1.602 176 634 × 10^{-19} C	0	[16]
$G_0 = 2e^2/h$	conductance quantum	7.748 091 729... × 10^{-5} S	0	[17]
$G_0^{-1} = h/2e^2$	inverse conductance quantum	12 906.403 72... Ω	0	[18]

$R_K = h/e^2$	von Klitzing constant	25 812.807 45... Ω	0	[19]
$K_J = 2e/h$	Josephson constant	483 597.8484... × 10^9 Hz⋅V^{-1}	0	[20]
$\Phi_0 = h/2e$	magnetic flux quantum	2.067 833 848... × 10^{-15} Wb	0	[21]
$\alpha = e^2/4\pi\varepsilon_0\hbar c$	fine-structure constant	0.007 297 352 5643(11)	1.6 × 10^{-10}	[22]
α^{-1}	inverse fine-structure constant	137.035 999 177(21)	1.6 × 10^{-10}	[23]
$\mu_0 = 4\pi\alpha\hbar/e^2c$	vacuum magnetic permeability	1.256 637 061 27(20) × 10^{-6} N⋅A^{-2}	1.6 × 10^{-10}	[24]
$Z_0 = 4\pi\alpha\hbar/e^2$	characteristic impedance of vacuum	376.730 313 412(59) Ω	1.6 × 10^{-10}	[25]
$\varepsilon_0 = e^2/4\pi\alpha\hbar c$	vacuum electric permittivity	8.854 187 8188(14) × 10^{-12} F⋅m^{-1}	1.6 × 10^{-10}	[26]
m_e	electron mass	9.109 383 7139(28) × 10^{-31} kg	3.1 × 10^{-10}	[27]
m_μ	muon mass	1.883 531 627(42) × 10^{-28} kg	2.2 × 10^{-8}	[28]
m_τ	tau mass	3.167 54(21) × 10^{-27} kg	6.8 × 10^{-5}	[29]
m_p	proton mass	1.672 621 925 95(52) × 10^{-27} kg	3.1 × 10^{-10}	[30]
m_n	neutron mass	1.674 927 500 56(85) × 10^{-27} kg	5.1 × 10^{-10}	[31]
m_p/m_e	proton-to-electron mass ratio	1 836.152 673 426(32)	1.7 × 10^{-11}	[32]
m_W/m_Z	W-to-Z mass ratio	0.881 45(13)	1.5 × 10^{-4}	[33]
$\sin^2\theta_W = 1-(m_W/m_Z)^2$	sine-square weak mixing angle	0.223 05(23) [g] 0.231 21(4) [h] 0.231 53(4) [i]	1.0 × 10^{-3} 1.7 × 10^{-4} 1.7 × 10^{-4}	[34] [35] [35]
g_e	electron *g*-factor	−2.002 319 304 360 92(36)	1.8 × 10^{-13}	[36]
g_μ	muon *g*-factor	−2.002 331 841 23(82)	4.1 × 10^{-10}	[37]
g_p	proton *g*-factor	5.585 694 6893(16)	2.9 × 10^{-10}	[38]
$h/2m_e$	quantum of circulation	3.636 947 5467(11) × 10^{-4} m^2⋅s^{-1}	3.1 × 10^{-10}	[39]
$\mu_B = e\hbar/2m_e$	Bohr magneton	9.274 010 0657(29) × 10^{-24} J⋅T^{-1}	3.1 × 10^{-10}	[40]
$\mu_N = e\hbar/2m_p$	nuclear magneton	5.050 783 7393(16) × 10^{-27} J⋅T^{-1}	3.1 × 10^{-10}	[41]
$r_e = \alpha\hbar/m_ec$	classical electron radius	2.817 940 3205(13) × 10^{-15} m	4.7 × 10^{-10}	[42]
$\sigma_e = (8\pi/3)r_e^2$	Thomson cross section	6.652 458 7051(62) × 10^{-29} m^2	9.3 × 10^{-10}	[43]
$a_0 = \hbar/\alpha m_ec$	Bohr radius	5.291 772 105 44(82) × 10^{-11} m	1.6 × 10^{-10}	[44]
$R_\infty = \alpha^2m_ec/2h$	Rydberg constant	10 973 731.568 157(12) m^{-1}	1.1 × 10^{-12}	[45]

$\mathrm{Ry} = R_\infty hc = E_\mathrm{h}/2$	Rydberg unit of energy	$2.179\,872\,361\,1030(24) \times 10^{-18}$ J	1.1×10^{-12}	[46]
$E_\mathrm{h} = \alpha^2 m_\mathrm{e} c^2$	Hartree energy	$4.359\,744\,722\,2060(48) \times 10^{-18}$ J	1.1×10^{-12}	[47]
$G_\mathrm{F}/(\hbar c)^3$	Fermi coupling constant	$1.166\,3787(6) \times 10^{-5}$ GeV^{-2}	5.1×10^{-7}	[48]
N_A	Avogadro constant	$6.022\,140\,76 \times 10^{23}$ mol^{-1}	0	[49]
$R = N_\mathrm{A} k_\mathrm{B}$	molar gas constant	$8.314\,462\,618\,153\,24$ $\mathrm{J{\cdot}mol^{-1}{\cdot}K^{-1}}$	0	[50]
$F = N_\mathrm{A} e$	Faraday constant	$96\,485.332\,123\,310\,0184$ $\mathrm{C{\cdot}mol^{-1}}$	0	[51]
$N_\mathrm{A} h$	molar Planck constant	$3.990\,312\,712\,893\,4314 \times 10^{-10}$ $\mathrm{J{\cdot}s{\cdot}mol^{-1}}$	0	[52]
$M(^{12}\mathrm{C}) = N_\mathrm{A} m(^{12}\mathrm{C})$	molar mass of carbon-12	$12.000\,000\,0126(37) \times 10^{-3}$ $\mathrm{kg{\cdot}mol^{-1}}$	3.1×10^{-10}	[53]
$m_\mathrm{u} = m(^{12}\mathrm{C})/12$	atomic mass constant	$1.660\,539\,068\,92(52) \times 10^{-27}$ kg	3.1×10^{-10}	[54]
$M_\mathrm{u} = M(^{12}\mathrm{C})/12$	molar mass constant	$1.000\,000\,001\,05(31) \times 10^{-3}$ $\mathrm{kg{\cdot}mol^{-1}}$	3.1×10^{-10}	[55]
$V_\mathrm{m}(\mathrm{Si})$	molar volume of silicon	$1.205\,883\,199(60) \times 10^{-5}$ $\mathrm{m^3{\cdot}mol^{-1}}$	4.9×10^{-8}	[56]
$\Delta\nu_\mathrm{Cs}$	hyperfine transition frequency of $^{133}\mathrm{Cs}$	$9\,192\,631\,770$ Hz	0	[57]

Uncertainties

While the values of the physical constants are independent of the system of units in use, each uncertainty as stated reflects our lack of knowledge of the corresponding value as expressed in SI units, and is strongly dependent on how those units are defined. For example, the atomic mass constant m_u is exactly known when expressed using the dalton (its value is exactly 1 Da), but the kilogram is not exactly known when using these units, the opposite of when expressing the same quantities using the kilogram.

Technical constants

Some of these constants are of a technical nature and do not give any true physical property, but they are included for convenience. Such a constant gives the correspondence ratio of a technical dimension with its corresponding underlying physical dimension. These include the Boltzmann constant k_B, which gives the correspondence of the dimension temperature to the dimension of energy per degree of freedom, and the Avogadro constant N_A, which gives the correspondence of the dimension of amount of substance with the dimension of count of entities (the latter formally regarded in the SI as being dimensionless). By implication, any product of powers of such constants is also such a constant, such as the molar gas constant R.

See also

- List of mathematical constants
- Mathematical constant
- Physical constant
- List of particles

Notes

a. The values are given in the so-called *concise form*; the number in parentheses is the *standard uncertainty* and indicates the amount by which the least significant digits of the value are uncertain.
b. In some instances an exact value has been displayed, calculated from the defining expression, rather than the incomplete decimal expansion as given by the source.
c. Planck Collaboration
d. 6-parameter ΛCDM fit
e. $b = \left(5 + W_0\left(-5e^{-5}\right)\right)^{-1} \frac{hc}{k}$, where W_0 is the principal branch of the Lambert *W* function.
f. $b' = \left(3 + W_0\left(-3e^{-3}\right)\right) \frac{k}{h}$, where W_0 is the principal branch of the Lambert *W* function.
g. CODATA value
h. minimal subtraction scheme definition
i. effective angle definition

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