17 Equations that Changed the World

1.	Pythagoras's Theorem	$a^2 + b^2 = c^2$	Pythagoras, 530 BC
2.	Logarithms	$\log xy = \log x + \log y$	John Napier, 1610
3.	Calculus	$\frac{df}{dt} = \lim_{h \to 0} = \frac{f(t+h) - f(t)}{h}$	Newton,1668
4.	Law of Gravity	$F = G\frac{m_1 m_2}{r^2}$	Newton, 1687
5.	Wave Equation	$\frac{\partial^2 u}{\delta t^2} = c^2 \frac{\partial^2 u}{\delta x^2}$	J. d'Almbert, 1746
6.	The Square Root of Minus One	$i^2 = -1$	Euler, 1750
7.	Euler's Formula for Polyhedra	$V - E + F = 2$	Euler, 1751
8.	Normal Distribution	$\Phi(x) = \frac{1}{\sqrt{2\pi\rho}} e^{\frac{(x-\mu)^2}{2\rho^2}}$	C.F. Gauss, 1810
9.	Fourier Transform	$f(\omega) = \int_{\infty}^{\infty} f(x) e^{-2\pi i x \omega}\, dx$	J. Fourier, 1822
10.	Navier-Stokes Equation	$\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla \mathbf{v}\right) = -\nabla\rho + \nabla \cdot \mathbf{T} + \mathbf{f}$	Navier, Stokes, 1845
11.	Maxwell's Equations	$\nabla \cdot \mathbf{E} = 0$ $\quad \nabla \cdot \mathbf{E} = 0$ $\nabla \times \mathbf{E} = -\frac{1}{c}\frac{\partial \mathrm{H}}{\partial t}$ $\quad \nabla \times \mathbf{E} = \frac{1}{c}\frac{\partial \mathrm{H}}{\partial t}$	J.C. Maxwell, 1865
12.	Second Law of Thermodynamics	$dS \geq 0$	L. Boltzmann, 1874
13.	Relativity	$E = mc^2$	Einstein, 1905
14.	Schrodinger's Equation	$i\hbar\frac{\partial}{\partial t}\Psi = H\Psi$	E. Schrodinger, 1927
15.	Information Theory	$H = -\sum p(x) \log p(x)$	C. Shannon, 1949
16.	Chaos Theory	$x_{t+1} = k x_t (1 - x_t)$	R. May, 1975
17.	Black-Scholes Equation	$\frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} - rV = 0$	Black, Scholes, 1990