17 Equations That Changed the World
by Ian Stewart

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**	$\dfrac{df}{dt} = \lim\limits_{h \to 0} = \dfrac{f(t+h) - f(t)}{h}$	Newton, 1668
4.	**Law of Gravity**	$F = G\dfrac{m_1 m_2}{r^2}$	Newton, 1687
5.	**The Square Root of Minus One**	$i^2 = -1$	Euler, 1750
6.	**Euler's Formula for Polyhedra**	$V - E + F = 2$	Euler, 1751
7.	**Normal Distribution**	$\Phi(x) = \dfrac{1}{\sqrt{2\pi\rho}} e^{\frac{(x-\mu)^2}{2\rho^2}}$	C.F. Gauss, 1810
8.	**Wave Equation**	$\dfrac{\partial^2 u}{\partial t^2} = c^2 \dfrac{\partial^2 u}{\partial x^2}$	J. d'Almbert, 1746
9.	**Fourier Transform**	$f(\omega) = \displaystyle\int_{\infty}^{\infty} f(x)e^{-2\pi i x\omega}\,dx$	J. Fourier, 1822
10.	**Navier-Stokes Equation**	$\rho\left(\dfrac{\partial \mathbf{v}}{\partial t} + \mathbf{v}\cdot\nabla\mathbf{v}\right) = -\nabla p + \nabla\cdot\mathbf{T} + \mathbf{f}$	C. Navier, G. Stokes, 1845
11.	**Maxwell's Equations**	$\nabla\cdot\mathbf{E} = 0 \qquad \nabla\cdot\mathbf{H} = 0$ $\nabla\times\mathbf{E} = -\frac{1}{c}\frac{\partial \mathbf{H}}{\partial t} \qquad \nabla\times\mathbf{H} = \frac{1}{c}\frac{\partial \mathbf{E}}{\partial t}$	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**	$i\hbar\dfrac{\partial}{\partial t}\Psi = H\Psi$	E. Schrodinger, 1927
15.	**Information Theory**	$H = -\displaystyle\sum p(x)\log p(x)$	C. Shannon, 1949
16.	**Chaos Theory**	$x_{t+1} = kx_t(1 - x_t)$	Robert May, 1975
17.	**Black-Scholes Equation**	$\dfrac{1}{2}\sigma^2 S^2\dfrac{\partial^2 V}{\partial S^2} + rS\dfrac{\partial V}{\partial S} + \dfrac{\partial V}{\partial t} - rV = 0$	F. Black, M. Scholes, 1990