The Equations That Changed The World

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Today, I stumbled upon an article highlighting the world's most transformative equations. It was a bit like a trip down memory lane, but instead of nostalgia, it felt like trying to decipher hieroglyphics. Remembering some of these equations from school gave me a headache and made me question all my life choices. Thought I'd share the joy (and the pain :)

1. Pythagoras's Theorem

$$a^2 + b^2 = c^2$$

2. Logarithms

$$\log xy = \log x + \log y$$

3. Calculus

$$\frac{df}{dt} = \lim_{h \to 0} \frac{f(t+h) - f(t)}{h}$$

4. Law of Gravity

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

5. The Square Root of Minus One

$$i^2 = -1$$

6. Euler's Formula for Polyhedra

$$V - E + F = 2$$

7. Normal Distribution

$$\Phi(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$$

8. Wave Equation

$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$

9. Fourier Transform

$$f(\omega) = \int_{-\infty}^{\infty} f(x) e^{-2\pi i \omega x} dx$$

10. Navier-Stokes Equation

$$\rho \left(\frac{\partial v}{\partial t} + v \cdot \nabla v \right) = -\nabla p + \nabla \cdot \mathbf{T} + f$$

11. Maxwell's Equations

$$\begin{aligned} \nabla \cdot \mathbf{E} &= 0 \\ \nabla \cdot \mathbf{H} &= 0 \\ \nabla \times \mathbf{E} &= -\frac{1}{c} \frac{\partial \mathbf{H}}{\partial t} \\ \nabla \times \mathbf{H} &= \frac{1}{c} \frac{\partial \mathbf{E}}{\partial t} \end{aligned}$$

12. Second Law of Thermodynamics

$$dS \geq 0$$

13. Relativity

$$E = mc^2$$

14. Schrödinger's Equation

$$i\hbar \frac{\partial \psi}{\partial t} = H\psi$$

15. Information Theory

$$H = -\sum p(x) \log p(x)$$

16. Chaos Theory

$$x_{t+1} = k x_t (1 - x_t)$$

17. Black-Scholes Equation

$$\frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS \frac{\partial V}{\partial S} + \frac{\partial V}{\partial t} - rV = 0$$