

The Beauty of Science

A Visual Journey Through Mathematics & Physics

Demo Document

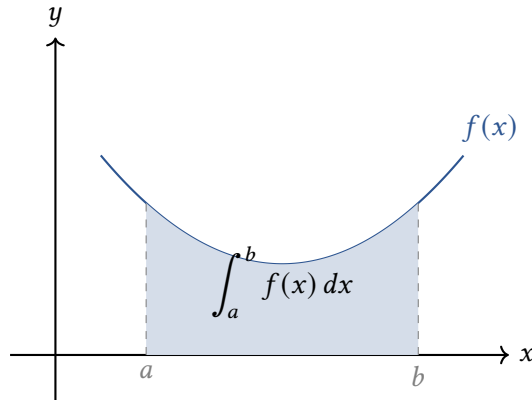
January 22, 2026

1 The Fundamental Theorem of Calculus

Theorem 1.1: Fundamental Theorem of Calculus

Let f be continuous on $[a, b]$ and let F be an antiderivative of f . Then:

$$\int_a^b f(x) dx = F(b) - F(a) \quad (1)$$

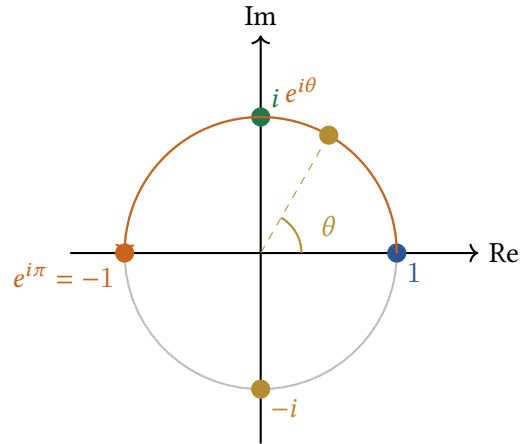


2 Euler's Identity

Definition 2.1: The Most Beautiful Equation

Euler's identity connects five fundamental constants of mathematics:

$$e^{i\pi} + 1 = 0 \quad (2)$$

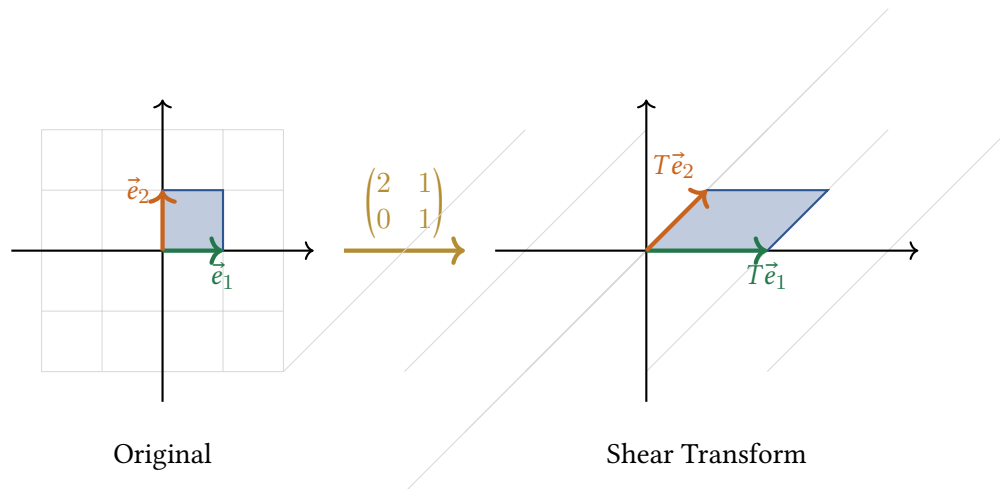


3 Linear Transformations

Definition 3.1: Matrix Transformation

A 2×2 matrix transforms vectors in the plane:

$$\underbrace{\begin{pmatrix} a & b \\ c & d \end{pmatrix}}_{\text{transformation}} \underbrace{\begin{pmatrix} x \\ y \end{pmatrix}}_{\text{input}} = \underbrace{\begin{pmatrix} ax + by \\ cx + dy \end{pmatrix}}_{\text{output}} \quad (3)$$

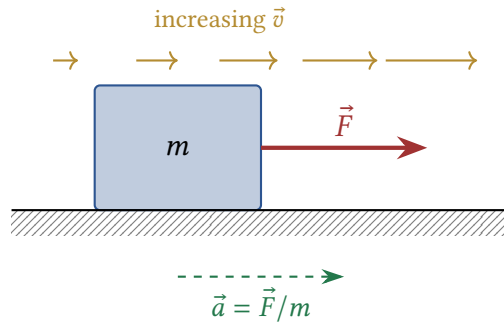


4 Newton's Laws of Motion

Law 4.1: Newton's Second Law

The acceleration of an object is proportional to the net force:

$$\vec{F} = m\vec{a} = m \frac{d^2\vec{r}}{dt^2} \quad (4)$$



5 Maxwell's Equations

Law 5.1: Electromagnetism

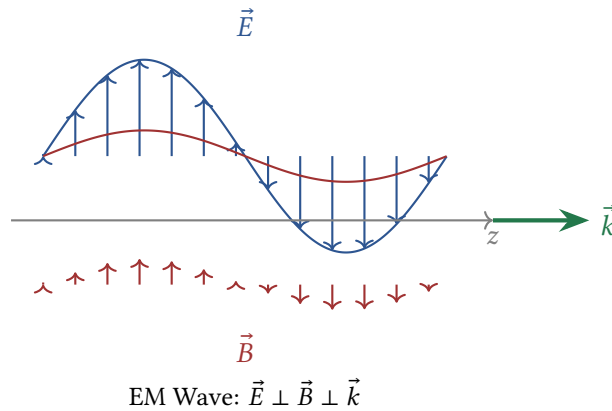
The four equations governing all electromagnetic phenomena:

$$\nabla \cdot \vec{E} = \frac{\rho}{\epsilon_0} \quad (\text{Gauss's Law}) \quad (5)$$

$$\nabla \cdot \vec{B} = 0 \quad (\text{No Monopoles}) \quad (6)$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t} \quad (\text{Faraday}) \quad (7)$$

$$\nabla \times \vec{B} = \mu_0 \vec{J} + \mu_0 \epsilon_0 \frac{\partial \vec{E}}{\partial t} \quad (\text{Ampère-Maxwell}) \quad (8)$$

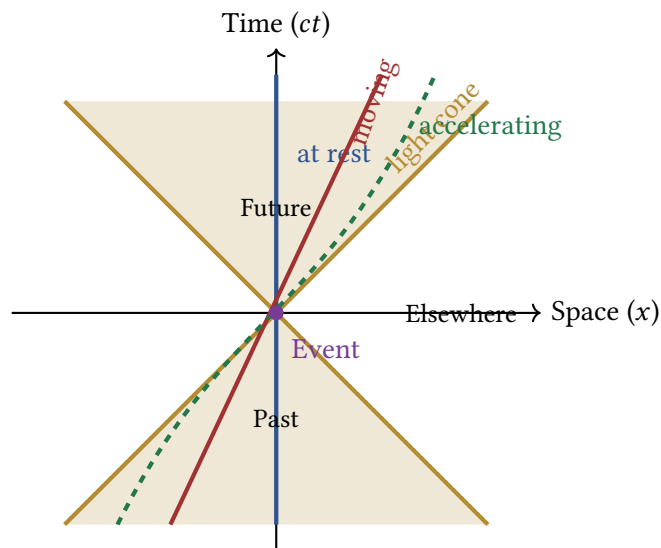


6 Special Relativity

Principle 6.1: Mass-Energy Equivalence (Einstein, 1905)

$$E = mc^2$$

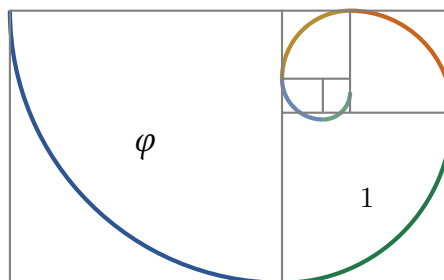
(9)



7 The Golden Ratio

Theorem 7.1: Divine Proportion

$$\varphi = \frac{1 + \sqrt{5}}{2} \approx 1.618 \dots \quad \text{with} \quad \lim_{n \rightarrow \infty} \frac{F_{n+1}}{F_n} = \varphi \quad (10)$$



“The book of nature is written in the language of mathematics.”

— Galileo Galilei