# Mathematical Equations Reference

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This document demonstrates various mathematical equations across different fields of mathematics and physics. The equations are created using the MS Word equation editor.

## Schrödinger Equation

The Schrödinger equation is a fundamental equation in quantum mechanics that describes how the quantum state of a physical system changes with time:

[Equation would be inserted here using Word's equation editor: iℏ ∂Ψ/∂t = -ℏ²/2m ∇²Ψ + VΨ]

## Einstein's Mass-Energy Equivalence

Perhaps the most famous equation in physics, showing the equivalence of mass and energy:

[Equation would be inserted here using Word's equation editor: E = mc²]

## Maxwell's Equations

The four Maxwell's equations describe how electric and magnetic fields are generated by charges, currents, and changes of the fields:

[Equation would be inserted here using Word's equation editor: ∇ · E = ρ/ε₀, ∇ · B = 0, ∇ × E = -∂B/∂t, ∇ × B = μ₀J + μ₀ε₀∂E/∂t]

## Euler's Identity

A beautiful equation in mathematics that establishes the relationship between five fundamental mathematical constants:

[Equation would be inserted here using Word's equation editor: e^(iπ) + 1 = 0]

## Taylor Series Expansion

A representation of a function as an infinite sum of terms calculated from the values of its derivatives at a single point:

[Equation would be inserted here using Word's equation editor: f(x) = f(a) + f'(a)(x-a) + f''(a)(x-a)²/2! + ... + f^(n)(a)(x-a)^n/n! + ...]

## Definite Integral

A definite integral represents the area under a curve between two points:

[Equation would be inserted here using Word's equation editor: ∫(a,b) f(x) dx = F(b) - F(a)]

## Navier-Stokes Equations

These equations describe the motion of fluid substances:

[Equation would be inserted here using Word's equation editor: ρ(∂v/∂t + v·∇v) = -∇p + μ∇²v + ρg]

## Pythagorean Theorem

In a right triangle, the square of the length of the hypotenuse equals the sum of squares of the other two sides:

[Equation would be inserted here using Word's equation editor: a² + b² = c²]

## Normal Distribution

The probability density function of the normal distribution:

[Equation would be inserted here using Word's equation editor: f(x) = (1/(σ√(2π))) e^(-(x-μ)²/(2σ²))]

## Fourier Transform

Transforms a function of time to a function of frequency:

[Equation would be inserted here using Word's equation editor: F(ω) = ∫(-∞,∞) f(t)e^(-iωt) dt]