Math Symbols & Notation

Arithmetic and Algebra

- $+$, $-$: Addition, Subtraction.
- $\times$, $\cdot$, $*$: Multiplication.
- $\div$, $/$: Division.
- $\pm$: Plus-minus.
- $\mp$: Minus-plus.
- $\approx$: Approximately equal.
- $\neq$: Not equal.
- $\equiv$: Equivalent to / Defined as.
- $\propto$: Proportional to.
- ∞: Infinity.
- $<$, $>$: Less than, Greater than.
- $\leq$, >=: Less than or equal to, Greater than or equal to.
- $|x|$: Absolute value of x.
- x^n: x to the power of n.
- $\sqrt{x}$: Square root of x.
- $n!$: n factorial.

Set Theory

- $\in$: Element of (e.g., $x \in A$).
- $\notin$: Not an element of.
- $\subset$: Proper subset.
- $\subseteq$: Subset (can be equal).
- $\cup$: Union.
- $\cap$: Intersection.
- $\emptyset$: Empty set.
- $\mathbb{N}$: Natural numbers $(1, 2, 3, ...)$.
- $\mathbb{Z}$: Integers $(..., -1, 0, 1, ...)$.
- $\mathbb{Q}$: Rational numbers.
- $\mathbb{R}$: Real numbers.
- $\mathbb{C}$: Complex numbers.

Logic

- $\forall$: For all.
- $\exists$: There exists.
- $\nexists$: There does not exist.
- $\Rightarrow$: Material implication (If... then).
- $\Leftrightarrow$: Biconditional (If and only if).
- $\neg$, $\sim$: Logical NOT.
- $\wedge$, &: Logical AND.
- $\vee$: Logical OR.
- $\therefore$: Therefore.
- $\because$: Because.

Calculus and Analysis

- $\partial\frac{y}{\partial}x$: Derivative of y with respect to x.
- ∂: Partial derivative.
- $\int$: Integral.
- $\iint$, $\iiint$: Multiple integrals.
- $\oint$: Line integral over a closed curve.
- $\lim_{x \to a}$: Limit as x approaches a.
- $\sum$: Summation.
- $\prod$: Product of a sequence.
- Δ: Delta (Difference or Change).
- ∇: Nabla (Gradient operator).

Linear Algebra and Vectors

- $\boldsymbol{v}$, (v): Vector v.
- $\|\boldsymbol{v}\|$: Norm of vector v.
- $\boldsymbol{A}$, $\boldsymbol{M}$: Matrices.
- $\boldsymbol{A}^T$: Transpose of matrix A.
- $\boldsymbol{A}^{-1}$: Inverse of matrix A.
- $\det(\boldsymbol{A})$: Determinant of matrix A.
- $\times$: Cross product.
- $\cdot$: Dot product (Scalar product).
- $\otimes$: Kronecker product.

Greek Letters (Commonly used)

- α, β, γ: Alpha, Beta, Gamma.
- δ, Δ: Delta.
- ε, ϵ: Epsilon.
- θ: Theta (Angles).
- λ: Lambda (Eigenvalues, Wavelength).
- μ: Mu (Mean, Micro).
- π: Pi.
- σ, Σ: Sigma (Std dev, Summation).
- φ, Φ: Phi (Golden ratio, Flux).
- ω, Ω: Omega (Angular frequency, Resistance).