

# Math Prerequisites: Software Engineering

## 1. Functions and Algebra

- **Fundamentals:** Domain, range, and inverse functions.
- **Function Types:**
  - Linear and Polynomial functions.
  - Rational functions.
  - Trigonometric functions (sine, cosine, tangent).
  - Exponential and Logarithmic functions (including laws of logarithms).

## 2. Differential Calculus

- **Limits:** The concept of the limit and continuity.
- **Differentiation Techniques:** The Product, Quotient, and Chain rules.
- **Applications:** Finding equations of tangents and normals.

## 3. Integral Calculus

- **Fundamentals:** The indefinite and definite integral.
- **Integration Techniques:**
  - Standard integration rules.
  - Integration by substitution.
  - Integration by parts.
- **Applications:**
  - Calculation of area under a curve.
  - Calculation of volumes of revolution.

## 4. Vectors (2D)

- **Vector Arithmetic:** Operations in two dimensions.
- **Vector Products:** The scalar (dot) product.
- **Geometry:** Vectors in coordinate geometry settings.

## 5. Differential Equations

- **First Order Equations:** Separable differential equations.
- **Solutions:** Finding general and particular solutions.