1 Basic Formulas

1.1 Inline Formulas

- The quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- Euler's identity: $e^{i\pi} + 1 = 0$
- The Pythagorean theorem: $a^2 + b^2 = c^2$

1.2 Display Formulas

1.2.1 Centered Display Formula

$$F = ma$$

Newton's second law of motion.

1.2.2 Numbered Display Formula

$$E = mc^2 \tag{1}$$

Einstein's famous equation.

2 Special Symbols

2.1 Greek Letters

Some Greek letters:

$$\alpha, \beta, \gamma, \Delta, \Theta, \pi, \omega$$

2.2 Set Notation

Set notation:

$$A = \{1, 2, 3\}, \quad B = \mathbb{R}$$

3 Advanced Formulas

3.1 Matrices and Vectors

Matrix multiplication:

$$\mathbf{A} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

Vector equation:

$$\mathbf{Ax} = \mathbf{b}$$

3.2 Complex Equations

De Moivre's theorem:

$$(\cos\theta + i\sin\theta)^n = \cos(n\theta) + i\sin(n\theta)$$

3.3 Calculus

Derivatives and integrals:

$$\frac{d}{dx}(x^n) = nx^{n-1}$$

$$\int_0^1 x^2\,dx = \frac{1}{3}$$