Test Document

Eason Shao

November 23, 2025

1 Symbols

1.1 Misc

$$\varepsilon, n^{-1}, \text{LHS}, \text{RHS}, \theta^\circ$$

1.2 Sets

$$\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}, \mathbb{P}, \varnothing$$

1.3 Functions

$$\text{im}, \text{ker}$$

$$\text{sign}, \text{Id}, \mathbf{1}$$

1.3.1 Trigonometric and Hyperbolic Functions

$$\sin, \cos, \tan, \cot, \sec, \csc$$

$$\arcsin, \arccos, \arctan, \text{arccot}, \text{arcsec}, \text{arccsc}$$

$$\sinh, \cosh, \tanh, \coth, \text{sech}, \text{csch}$$

$$\text{arsinh}, \text{arcosh}, \text{artanh}, \text{arcoth}, \text{arsech}, \text{arcsch}$$

1.3.2 UK Notation

$$\text{cosec}, \text{cosech}, \text{arccosec}, \text{arcosech}$$

1.3.3 Exponential and Logarithmic Functions

$$\exp, \log, \ln, \lg, \text{lb}$$

1.4 Number Theory

$$\varphi, \gcd, \text{lcm}, \max, \min$$

$$7 \bmod 2, 2 \mid 6, 2 \nmid 7$$

1.5 Group Theory

$$\text{Isom}, \text{Sym}, \text{Fix}, \text{Orb}, \text{Stab}$$

$$\curvearrowright, \leq, \triangleleft$$

1.6 Analysis

$$\text{LUB}, \text{supremum}, \sup, \text{GLB}, \text{infimum}, \inf$$

$$\limsup, \liminf, \lim$$

1.6.1 Infinity

$$\infty, +\infty, -\infty$$

1.6.2 Differetiation

$$\mathrm{d}x, \frac{\mathrm{d}y}{\mathrm{d}x}, \frac{\mathrm{d}}{\mathrm{d}x}$$

$$\mathrm{d}^2x, \frac{\mathrm{d}^2y}{\mathrm{d}x^2}, \frac{\mathrm{d}^2}{\mathrm{d}x^2}$$

$$\partial x, \frac{\partial y}{\partial x}, \frac{\partial}{\partial x}$$

$$\partial^2 x, \frac{\partial^2 y}{\partial x^2}, \frac{\partial^2}{\partial x^2}$$

1.7 Probability

$$\mathbb{P}, \mathbb{E}, \mathrm{Var}, \mathrm{Cov}, \mathrm{Corr}$$

1.7.1 Distribution

$$\mathrm{B}, \mathrm{Po}, \mathrm{N}, \mathrm{Exp}, \mathrm{Geo}, \mathrm{U}$$

1.8 Complex Numbers

$$\arg, \mathrm{Im}, \mathrm{Re}, \overline{z}$$

1.9 Linear Algebra

$$\det, \mathrm{tr}, \mathrm{adj}, \mathrm{null}, \mathrm{rank}, \mathrm{span}$$

1.9.1 Matrices

$$\mathbf{M}, \mathbf{I}, \mathbf{O}, \mathbf{M}^\mathsf{T}, \mathbf{M}^\dagger$$

1.9.2 Matrix Groups

$$\mathrm{GL}, \mathrm{SL}, \mathrm{O}, \mathrm{SO}, \mathrm{U}, \mathrm{SU}, \mathbb{P}\mathrm{GL}, \mathbb{P}\mathrm{SL}$$

1.9.3 Basis Vectors

$$\hat{\mathbf{i}}, \hat{\mathbf{j}}, \hat{\mathbf{k}}$$

1.10 Paired Delimiters

$$\left(\frac{a}{b}\right), \left[\frac{a}{b}\right], \left\{\frac{a}{b}\right\}$$

$$\left\lceil\frac{a}{b}\right\rceil, \left\lfloor\frac{a}{b}\right\rfloor, \left|\frac{a}{b}\right|, \left\langle\frac{a}{b}\right\rangle$$

$$\left\{x \in \mathbb{R} \,\middle|\, x = \frac{a}{b}\right\}$$

2 Theorems

Definition 2.1 (Some Definition)**.** This is a *definition*.

Theorem 2.2 (Very Important Theorem)**.** *This is a very important theorem.*

Proof. Some proof. □

Corollary 2.3 (Obvious Corollary)**.** *A corollary.*

Lemma 2.4 (Some Lemma)**.** *Some lemma.*

Claim 2.5 (Some Claim)**.** *Some claim.*

Proposition 2.6 (Some Proposition)**.** *A proposition.*

Remark. Some remark on this proposition.