

# Test Document

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## 1 Symbols

### 1.1 Misc

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

### 1.2 Sets

$\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$   
 $\mathbb{P}, \mathbb{F}, \mathbb{Q}_\times, \#\mathbb{N}, \emptyset$

### 1.3 Functions

im, ker  
sign, Id,  $\mathbf{1}$

#### 1.3.1 Trigonometric and Hyperbolic Functions

sin, cos, tan, cot, sec, csc  
arcsin, arccos, arctan, arccot, arcsec, arccsc  
sinh, cosh, tanh, coth, sech, csch  
arsinh, arcosh, artanh, arcoth, arsech, arcsch

#### 1.3.2 UK Notation

cosec, cosech, arccosec, arcosech

#### 1.3.3 Exponential and Logarithmic Functions

exp, log, ln, lg, lb

### 1.4 Number Theory

$\varphi, \gcd, \lcm, \max, \min$   
 $7 \bmod 2, 2 \mid 6, 2 \nmid 7$

### 1.5 Group Theory

Isom, Sym, Fix, Orb, Stab  
 $\curvearrowright, \leq, \triangleleft$

### 1.6 Analysis

LUB, supremum, sup, GLB, infimum, inf  
 $\limsup, \liminf, \lim$

### 1.6.1 Infinity

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

### 1.6.2 Differentiation

$$\begin{aligned} & \frac{dy}{dx}, \frac{d}{dx} \\ & \frac{d^2y}{dx^2}, \frac{d^2}{dx^2} \\ & \frac{\partial y}{\partial x}, \frac{\partial}{\partial x} \\ & \frac{\partial^2 y}{\partial x^2}, \frac{\partial^2}{\partial x^2} \end{aligned}$$

## 1.7 Probability

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

### 1.7.1 Distribution

B, Po, N, Exp, Geo, U

## 1.8 Complex Numbers

$\arg, \text{Im}, \text{Re}, \bar{z}$

## 1.9 Linear Algebra

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

### 1.9.1 Matrices

$\mathbf{M}, \mathbf{I}, \mathbf{O}, \mathbf{M}^\top, \mathbf{M}^\dagger$

### 1.9.2 Matrix Groups

GL, SL, O, SO, U, SU, PGL, PSL

### 1.9.3 Basis Vectors

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

## 1.10 Paired Delimiters

$$\begin{aligned} & \left( \begin{matrix} a \\ b \end{matrix} \right), \left[ \begin{matrix} a \\ b \end{matrix} \right], \left\{ \begin{matrix} a \\ b \end{matrix} \right\} \\ & \left\lceil \begin{matrix} a \\ b \end{matrix} \right\rceil, \left\lfloor \begin{matrix} a \\ b \end{matrix} \right\rfloor, \left| \begin{matrix} a \\ b \end{matrix} \right|, \left\langle \begin{matrix} a \\ b \end{matrix} \right\rangle \\ & \left\{ x \in \mathbb{R} \mid x = \frac{a}{b} \right\} \end{aligned}$$

## 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. ■

**Examples**

Some examples of the theorem.

**Notation.** The previous theorem allows us to abuse notation.

**Corollary 2.3 (Obvious Corollary)**

A corollary.

**Example (An example)**

An example.

**Lemma 2.4 (Some Lemma)**

Some lemma.

**Claim 2.5 (Some Claim)**

Some claim.

*Remark.* This is a remark on the claim.

**Proposition 2.6 (Some Proposition)**

A proposition.

*Remarks.* Some remarks on this proposition.