

# Test Document

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## 1 Symbols

### 1.1 Misc

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

### 1.2 Sets

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

### 1.3 Functions

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

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

#### 1.3.1 Trigonometric and Hyperbolic Functions

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

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

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

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

#### 1.3.2 UK Notation

$\text{cosec}, \text{cosech}, \text{arc cosec}, \text{arc cosech}$

#### 1.3.3 Exponential and Logarithmic Functions

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

### 1.4 Number Theory

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

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

### 1.5 Group Theory

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

$\curvearrowright, \leq, \triangleleft$

### 1.6 Analysis

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

$\limsup, \liminf, \lim$

### 1.6.1 Infinity

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

### 1.6.2 Differentiation

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

## 1.7 Probability

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

### 1.7.1 Distribution

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

## 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

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

### 1.9.3 Basis Vectors

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

### 1.10 Paired Delimiters

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

## 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 2.1**

*Some examples of the theorem.*

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

### **Corollary 2.3** (*Obvious Corollary*)

*A corollary.*

### **Example 2.2** (*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.