

MY ARTICLE

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1. INTRODUCTION

A good introduction to fractal geometry is Falconer [?]. There is `smallmatrix` environment (e.g, $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$). It is recommended to use $\dots, \cdots, \cdots, \cdots, \dots$ instead of \dots and \cdots . Then we test the `\nobreakdash`: , page 19, , [1], . What about a text-mode fractional: $\frac{\log_k H}{1212}$.

Then for the `\xleftarrow`:

$$(1.1) \quad A \xleftarrow{n+\mu-1} B \xrightarrow[n]{n\pm i-1\mathrm{bla}, \mathrm{bla}, \mathrm{bla}} C_{i\geq 1} A_{i_k=1}^{100} \Upsilon_k$$

$$\Leftrightarrow$$

Compare the `\choose` and `\binom`: $\binom{n}{k} \binom{n}{k}$. $z, v, [\infty]v$.

About the user-defined math operators:

$$((A_i)) \mathop{\mathrm{abc}}_{x \rightarrow 0}^{n \rightarrow \infty}$$

Then the `\mod`: $\gcd(n, m \bmod n)$; $x \equiv y \pmod{b}, x \equiv y \pmod{c}, x \equiv y \pmod{d}$.

See the following default math environments:

$$(1.2) \quad \vec{F} = m\vec{a}$$

$$\vec{F} = G \frac{m_1 m_2}{r^2}$$

$$(1.3a) \quad \nabla \cdot \vec{E} = \varepsilon_0 \rho$$

$$(1.3b) \quad \nabla \cdot \vec{B} = 0$$

$$(1.3c) \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$(1.3d) \quad \nabla \times \vec{B} = \mu_0 \varepsilon_0 \vec{J} + \frac{\partial \vec{E}}{\partial t}$$

$$(1.4) \quad E = \gamma mc^2$$

$${}_{\mu\nu} - \frac{1}{2}g_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4}T_{\mu\nu}$$

- `\substack{}` and `\begin{subarray}`

$$(1.5) \quad \sum_{\substack{0 \leq i \leq m \\ 0 < j < n}} P(i, j)$$

$$(1.6) \quad \sum_{\substack{i \in \Lambda \\ 0 < j < n}} P(i, j)$$

♡ `\sideset{text}{right}{symbol}`

$$a_0 + \frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{a_3 + \cdots}}}$$

$$(1.7) \quad \left\{ \prod_{n=1}^{\infty} \left[\prod_{n=1}^{*\infty} \sum_{\lim_{n \rightarrow \infty}} \prod_{n=1}^{\infty} \right] \right\} \lim_{n \rightarrow \infty} \text{Quantum Computing}$$

The `\mathbf` command is commonly used to obtain bold Latin letters in math, but for most other kinds of math symbols it has no effect.

`\mid` and `\mathbin{}` : $P(A \mid B)P(A \mid B)P(A|B)$

- (a) `f : X \to Y` vs. `f \colon X \to Y`: $f : X \rightarrow Y$ vs. $f : X \rightarrow Y$.
- (b) `:=` vs. `\coloneqq` : $:=$ vs. $:=$.
- (c) `{z : z \in}` vs. `{z: z \in}`.
- (d) v_1, v_2, \dots, v_n vs. v_1, \dots, v_n .
- (e) $f(n) = O(n)$ vs. $f(n)$ is $O(n)$ or $f(n) \in O(n)$.
- (f) $A \setminus B$ vs. $A \backslash B$ vs. $A - B$.
- (g) There is a `\`, spacing between integrand and measure

$$\int_a^b x^2 dx$$

- (h) Use `Serre et al.` `\ proved`: Serre et al. proved.
`Serre et al. proved`: Serre et al. proved.
- (i) `\text box` & `\math box` `\square`.
- (j) `\vv{AB}` \overrightarrow{AB} vs. `\overrightarrow{AB}` \overrightarrow{AB}
- (k) `if...` statements:
 - `\ifnum\value{num}>n {A} \else {B}\fi`: A
 - `\ifodd\value{num} {A}\else {B}\fi`: B
 - `\ifthenelse{(\NOT 4<2 \OR 4>11)\AND\isodd{4}}{A}{B}`: B
- (l) loops:
 - `@for`: The sun is rising. The sun is setting.
 - `@whilenum`: 1 Δ 3 Λ 5 Π 7 Υ 9 Ψ 11 ff 13 fl 15 ffi 17 j 19 ´
 - `\loop...\repeat`: 1 † 2 ‡ 3 § 4 ¶ 5 || 6 ** 7 †† 8 ‡‡

Soft page break with `\pagebreak`

Here is some practical suggestions for mathematical writting.

- (1) The structures for conditional sentences: **If ... , then...**; **When...**, ...; **For ... , ...**. No **Let...**. **Then...**!
- (2) Avoid using **as** and **for** to introduce reasons after some conclusion.
- (3) **Hence**, **Thus**, and **Therefore**, .
- (4) , **so** is informal and should be used when the conclusion is short.
- (5) A statement that is **assumed** is an axiom, and throughout to be true. Something **supposed** is a hypothesis and more appropriate to introduce a case or an argument by contradiction. For example, **Suppose to the contrary that** and **Toward a contradiction**, **suppose that**.
- (6) No v 's or a_i 's.
- (7) No *nested* proof environments.
- (8) **We induct on n** vs. **We use induction on n**.
- (9) Prefer **pairwise** to **mutually**.
- (10) No contractions like **can't**, **won't**, etc.
- (11) Use `\begingroup\allowdisplaybreaks ... \endgroup` to allow the large chunk of math display environments to be broken into pages.
- (12) Replace `$$... $$` with `\[...]` in `sed`:
`sed '/\$\$/{:x;N;/.*\$\$ *$!/bx;s/\$\$(.*)\$\$ *$/\[\1\]/}'`
- (13) Use `\emph{}` over `\textit{}`
- (14) More built-in letters. Hebrew letters: \aleph_{\beth} ; Others: $\nabla_{\varphi} \hbar \iota \jmath$

2. COMMUTATIVE DIAGRAMS

Arrows `@>>>` `@<<<` `@VVV` `@AAA`. Double lines: `@=`. Null arrows: `@`

$$(2.1) \quad \begin{array}{ccc} S^{\mathcal{W}_\Lambda \otimes T} & \xrightarrow{j} & T \\ \parallel & & \downarrow_{\text{End } P} \\ (S \otimes T)/I & \equiv & (Z \otimes T)/J \end{array}$$

`tikzcd` is the ultimate answer to a commutative diagram in \TeX .

$$\begin{array}{ccc} A & \xrightarrow{\phi} & B \\ & \searrow & \\ & & C \end{array}$$

Hard page break with `\newpage`

3. REFERENCE & CITATION

Choose a natbib compatible `\bibliographystyle`, e.g. `abbrvnat`, `plainnat`.

- `\cite{}`: [?]
- `\citet{}`: ?]
- `\citet*{}`: ?]
- `\citep{}`: [?]
- `\citep*{}`: [?]
- `\citealt*{}`: ?
- `\citeyear{}`: ?
- `\citeauthor{}`: ?
- `\citeauthor*{}`: ?
- `\cite[text]{keylist}` [? , Theorem 1]
- `\cite[prefix][suffix]{keylist}`: [see e.g. ? , p.123]
- `\citenum{}`: ?
- `\citeyearpar{}`: [?]
- `\citefullauthor{}`: ?

See also a book [?] and an arXiv preprint [?]. More multi-authors citation like [?] and [?].

Remark 3.1. For the use of `natbib` and format of arXiv preprint, it is recommended to use the `.bst` files `*nat.bst` or `*natDOI.bst` at

<https://github.com/zfengg/toolkit/tree/master/tex/bst>.

Otherwise, all the other default `bst` styles suffices.

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