Sample of TEX writing

Daiji Tsutsui

July 2, 2020

Abstract

One can write a brief explain of his paper. Blah-blah-.

Contents

1 Mathematical statement

1.1 Definition

The first sentence does not need an indent.

Definition 1.1 (First definition)**.** *The symbol* $\mathbb{R}$ *denotes the set of real numbers.*

To our best knowledge, this notation is standard.

1.2 Theorem

The following theorem is well-known.

Theorem 1.2. *The set* $\mathbb{N}$ *is countable.*

Proof. It is obvious by definition of $\mathbb{N}$ [1]. □

Due to the theorem above, we obtain an important corollary.

Corollary 1.3. *Any subset of* $\mathbb{N}$ *is countable.*

Remark 1.4. *It is known that* $\mathbb{Q}$ *is also a countable set; however, this margin is too narrow to contain the proof.*

In his work [1], Fujiwara showed the next fact.

Proposition 1.5. *Fujiwara likes walking.*

[1] The expression "by definition" does not need "the", since it is an idiom.

2 Environments for equations

In this section, we compare some environments for presenting mathematical equations. The *equation* environment can present a single equation.

Example 2.1 (equation)**.** *The geodesic equation on a Riemannian manifold* (M, g) *is given by*

$$\frac{d^2c^k}{dt^2} + \Gamma^k_{ij}\frac{dc^i}{dt}\frac{dc^j}{dt} = 0. \tag{1}$$

In order to write several equations, we can use the *eqnarray* environment.

Example 2.2 (eqnarray)**.** *The symbols* (Γ^k_{ij}) *in* (1) *denote functions defined by*

$$\Gamma^k_{ij} \quad := \quad g^{kl}\Gamma_{ij;l}, \tag{2}$$

$$\Gamma_{ij;l} \quad := \quad \frac{1}{2}\left(\frac{\partial g_{jl}}{\partial x_i} + \frac{\partial g_{li}}{\partial x_j} - \frac{\partial g_{ij}}{\partial x_l}\right). \tag{3}$$

We can also use the *align* environment. The author prefer this one to the eqnarray environment.

Example 2.3 (align)**.** *The functions defined by* (2) *and* (3) *are called the coefficients of the Levi-Civita connection. They are characterized by the conditions*

$$\Gamma^k_{ij} = \Gamma^k_{ji}, \tag{4}$$

$$\frac{\partial g_{jk}}{\partial x^i} = \Gamma_{ij;k} + \Gamma_{ik;j}. \tag{5}$$

Finally, we introduce a simple way to write an equation like

$$1 + 1 = 2.$$

This command is useful to describe a series of calculation.

References

[1] A. Fujiwara, *Foundations of information geometry*, (Makino Shoten, Tokyo, 2015); in Japanese.