Sample LaTeX Document

(Your Name Goes Here)

August 4, 2020

Abstract

This is where you will write your abstract containing a brief description of all of your brilliant mathematical results.

1 Introduction

Put your introduction here. You can tell us here about the structure of your paper. For example, in Section 2 we are going to show you how to write a few things using LaTeX. If you use the hyperref package, then labels will be clickable! You can also add links in your paper to other online references.

2 Main results

You can write mathematics inline such as $\frac{a}{b}$ or $\lim_{x\to 0} \frac{\sin x}{x} = 1$. You can force full-sized inline mathematics like this, $\lim\limits_{x\to 0} \dfrac{\sin x}{x} = 1$, but because it is so large, it may not look great. Better, you can put the mathematics on its own line,

$$\sum_{k=0}^{\infty} \frac{1}{2^k} = 2.$$

We can write in *italics*, or **boldface**, or `typewriter font`. We can also underline text. We can make "blackboard bold" letters (notice how we made the quotes) to denote the natural numbers, rational numbers, real numbers, and integers,

$$\mathbb{Q} = \{\frac{a}{b} \in \mathbb{R} : a, b \in \mathbb{Z},\ b \neq 0\}.$$

Notice that the brackets are a bit too small in the equation above, so we can make them a bit bigger as follows:

$$\mathbb{Q} = \left\{\frac{a}{b} \in \mathbb{R} : a, b \in \mathbb{Z},\ b \neq 0\right\}.$$

Also, we might want to refer to an equation later on, so we might want a label:

$$f\colon \mathbb{R} \to \mathbb{R} \text{ such that } f(x) = \sin(x). \tag{1}$$

Now we can refer to Eq. (1) that we have previously defined.

We can make matrices of various types,

$$A = \begin{pmatrix} 1 & 0 & 4 & -1 \\ 0 & 1 & -3 & 1 \\ 0 & 0 & 0 & 1 \end{pmatrix} = \begin{bmatrix} 1 & 0 & 4 & -1 \\ 0 & 1 & -3 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix},$$

as well as piecewise defined functions,

$$|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}.$$

Sometimes we like to have equations aligned over several lines.

$$\begin{aligned} (a+b)^3 &= (a+b)(a+b)^2 \\ &= (a+b)(a^2+ab+ab+b^2) \\ &= (a+b)(a^2+2ab+b^2) \\ &= a^3+2a^2b+ab^2+a^2b+2ab^2+b^3 \\ &= a^3+3a^2b+3ab^2+b^3 \end{aligned}$$

We can make unordered lists.

- Alabama
- Alaska
  - Juno
  - Fairbanks
  - Anchorage
- Arizona

We can also make ordered lists.

1. Cat
2. Dog
   (a) Golden retriever
   (b) Black lab

(c) Mutt

3. Gerbil

LaTeX will format definitions, theorems, corollaries, proposition, lemmas, etc. For instance we have the following examples.

Definition 1 (Definition of limit)**.** *Let f be a function defined on an open interval containing $x = a$, but perhaps not at $x = a$. We say $\lim_{x\to a} f(x) = L$ if for any $\epsilon > 0$ there exists $\delta > 0$ such that $|f(x) - L| < \epsilon$ whenever $0 < |x - a| < \delta$.*

Definition 2. *The derivative of f is defined to be $f'(x) = \lim_{h\to 0} \dfrac{f(x+h) - f(x)}{h}$, if this limit exists.*

Theorem 3 (Fundamental Theorem of Calculus)**.** *If f is continuous on the interval $[a, b]$, then*

$$\frac{d}{dx} \int_a^x f(t)dx = f(x)$$

for all $a \leq x \leq b$.

Proof. Proof goes here □

Corollary 4. *If f is continuous on the interval $[a, b]$, then*

$$\int_a^b f(x)dx = F(b) - F(a)$$

where F is any antiderivative of f.

You can reference sections (for instance, this section is Section 2). You can also reference definitions (the definition of derivative is Definition 2), theorems (the Fundamental Theorem of Calculus is Theorem 3), etc.

You can put tables in your document and can refer to them by label, such as Table 1. Likewise, you can put images (jpg, png, pdf, and tiff files) in your document and refer to them by label, such as Figure 1.

A	B	$A \wedge B$
T	T	T
T	F	F
F	T	F
F	F	F

Table 1: Truth table for $A \wedge B$

You can cite books, such as [2] or cite a specific page or result in a book [2, p. 314], or journal articles such as [1].

In 1732, Euler proved that $4,294,967,297$ *is composite.*

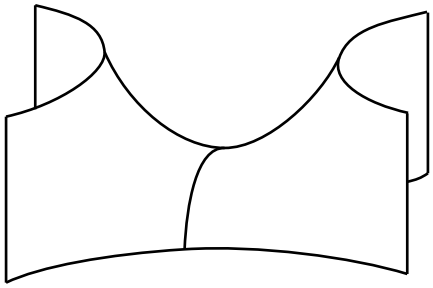

Figure 1: This is a saddle.

References

[1] Franks, John, Richeson, David (2000) Shift equivalence and the Conley index. *Trans. Amer. Math. Soc.*, 352(7):3305–3322.

[2] Richeson, David (2008). *Euler's Gem: The Polyhedron Formula and the Birth of Topology*. Princeton, NJ: Princeton University Press.