The LaTeX template file for an article in the ΠME Journal

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Abstract

This is a sample file. You can use it as a guide for your submission.

1 LaTeX

Use sectioning commands for headings. Often longer articles are divided into a few sections.

LaTeXknows that a new paragraph has started if you skip a line in the input file. It will automatically indent the proper amount.

You must use labelling commands, e.g. `\label`, `\ref`, `\bibitem`, and `\cite`, to refer to sections of your document, such as see Section **??**, see Figure **??**, or bibliography entries, such as see [**?**]. Otherwise, the look of the numbers, and sometimes the numbers themselves, will be wrong in the final version at the printer.

2 Abel's Theorem

In this section we give some background. For instance the following definition.

Definition 1 *A* semi-quaver *is defined to be half a quaver.*

If that definition is not enough, here is another:

Definition 2 *The* order *of a note n in a quaver Q, $O(n, Q)$, is defined by the equation*

$$O(n, Q) = \int_0^\infty \sin(n^2 t)/(1 - Qn)dt.$$

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Some equations one writes inline, such as *Pythagoras' Theorem,* $c^2 = a^2 + b^2$, while others are better off as displayed equations, like the quadratic formula,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

which solves the quadratic $ax^2 + bx + c = 0$. If the quadratic formula is written inline, $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$, it is readable but not very nice. This form, $x = (-b \pm \sqrt{b^2 - 4ac})/2a$, is harder to read as a fraction, but better because of the larger type.

Every inline equation must be part of a sentence: Since $x < 1/2$ we have $x + y < x + 1/2$. Inline fractions, such as $x < \frac{1}{2}$, are discouraged but not prohibited.

You can use formulae in theorems, as in the following.

Theorem 1 *If $f(x)$ is defined by the equation*

$$f(x) = \begin{cases} x^2, & \text{for } x \geq 0. \\ -x^2, & \text{for } x < 0 \end{cases} \tag{1}$$

Then $f(x)$ is continuous at $x = 0$.

PROOF: Since $\lim_{x \to 0^-} f(x) = \lim_{x \to 0^-} -x^2 = 0$ and $\lim_{x \to 0^+} f(x) = \lim_{x \to 0^+} x^2 = 0$ it follows that $\lim_{x \to 0} f(x) = 0 = f(x)$, as required. QED

Did you notice the grammatical error in Theorem **??**? The sentence leading into equation **??** is never completed. The following theorem is worded correctly.

Theorem 2 *If $f(x)$ is defined by the equation*

$$f(x) = \begin{cases} x^2, & \text{for } x \geq 0 \\ -x^2, & \text{for } x < 0 \end{cases}, \tag{2}$$

then $f(x)$ is continuous at $x = 0$.

One rule of thumb of mathematical composition is to use mathematical notation inside sentences only for nouns. For example, one writes that "R is the the radius of a circle", but not that "the radius of the circle ='s the side length of the square". According to this rule it is correct to write that "$(x > 0) \Rightarrow (x^3 > 0)$" since the double arrow is part of an equation, but not to write "x is positive $\Rightarrow$ x^3 is positive", since the double arrow is acting as a verb.

Here is another kind of common structure:

Theorem 3 *The following are equivalent.*

1. $a \leq b$
2. $b \geq a$
3. $a = b$ *or* $a < b$