The London Mathematical Society

Writing Mathematics

1. A paper should be written in clear, unambiguous and grammatically correct language. It is up to you to write correctly and to be understood. Make sure your intentions are clear and mark the manuscript where necessary. This is especially important where a typewriter is used and authors who submit typed manuscripts should take pains to leave no ambiguity.

2. If your native language is not English, try to get someone to check your manuscript: at least compare it with papers in the same area written by English-speaking authors.

3. Organise your writing so that sentences read naturally even when they incorporate formulae. In particular, arrange sentences so that they begin with words, not symbols. Formulae should not be separated merely by punctuation marks except in lists; authors should arrange for at least one word to come between two different formulae.

4. Punctuate your work carefully, using commas to avoid possible ambiguities. Commas should not be used after 'when'. A capital letter is used at the start of a sentence, that is following a full stop '.', but not, for example, after a colon ':'. While it is frequently desirable to follow a formula with a punctuation mark, it is only rarely correct for it to be immediately preceded by one.

5. Words such as 'assume', 'suppose', 'show', 'imply', ... should usually be followed by 'that', but 'have', 'get' and 'obtain' should not be.

6. Use abbreviation sparingly; mathematical writing is already very concentrated. We always use the full form of words like 'respectively', 'Theorem', 'Corollary'. Over-abbreviation, such as the use of 'l.i.' for 'linearly independent', which is commonly seen on the blackboard in lectures, should not be used in print. Do not use standard abbreviations such as 'e.g.', 'i.e.', adjacent to formulae or symbols. The abbreviation 'iff' is better not used in print. In text the full form 'if and only if' is easier to read (and looks less like a misprint); in formulae a double-headed arrow $\Leftrightarrow$ is more suggestive. Do not use symbols such as $\exists$, $\forall$, $=$, $<$ as abbreviations in text.

7. The scope of a binary relation such as $=$ or $<$ should be clear: usages like 'The number of prime divisors of $30 = 3$' are unnecessarily disturbing. Nonsensical abbreviations like '$\exists 0 < i < n$' and misleading constructions like 'Let $f(g)$ be the left (right) quotient' are not justifiable by the space that they save. Do not use constructions of the form 'where S (respectively T) is the kernel of ϕ (respectively ψ)'. It is much easier to read 'where S and T are the kernels of ϕ and ψ, respectively'. When longer statements are involved, repetition or even two sentences should be used.

8. Avoid inverted commas (quotation marks) adjacent to formulae. Do not use 'apostrophe s' with symbols: 'the functions f_i' is clearer than 'the f_i's' or than (the more correct) 'the f_i'.

9. Avoid the use of over-elaborate symbols. If $\subset$ and $\subseteq$ are used correctly, there should be no need to use $\subsetneqq$. Avoid also complicated subscripts, superscripts and ranges of summation or integration. Third-order superiors and inferiors cannot normally be printed, and even if printed cannot be read. Superscript and subscript expressions involving fractions should be written using a solidus, as, for example, $n/(q+1)$.

10. The introduction of 'Claim' as another in the 'Theorem, Proposition, Lemma' sequence is unnecessary. If none of the latter is appropriate, then statements for proof may be set in italic and numbered if desired.

The following work gives further advice about the presentation of mathematics.

Norman E. Steenrod, Paul R. Halmos, Menahem M. Schiffer and Jean R. Dieudonné, *How to write mathematics* (American Mathematical Society, Providence, RI, 1973).