

Journals of the London Mathematical Society: house style and instructions for copy-editors and typesetters

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ABSTRACT

This style guide is directed to editors, typesetters and proofreaders who are preparing papers for publication in the *Bulletin*, *Journal* and *Proceedings of the London Mathematical Society*.

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PART I. COPY-EDITING PROCEDURE

1. *Important notes*

Papers for all the London Mathematical Society journals are typeset with the $\text{\LaTeX}2\text{e}$ document preparation software, using purpose-designed ‘class file’ `lms-new.cls`, which enforces most of the requirements of formatting and layout.

As a consequence, it is not necessary to do a detailed mark-up of the formatting or layout; the copy-editor can concentrate on line-editing, grammar, punctuation and the style of individual section units, paragraphs, words and mathematical expressions. There remain a few cases where the class file cannot be fully relied on to format the document, and the copy-editor is asked to mark these.

This document contains four parts. Part I provides an introduction and general instructions. Part II contains the general conventions used, starting with a table describing the frontmatter.

Part III gives the detailed conventions used, first for elements of the paper (roughly in the order required), and second for editing of text and mathematics; Appendix A deals with nonstandard material (obituaries, book reviews, reports and papers in French). Finally, Part IV holds additional material for typesetters, relating to detailed numbering and formatting of headings, lists, tables and figures (Appendix B).

2. *Roman, slanted and italic*

§ 7.5

(a) *Roman font*. In this document, ‘roman’ will denote either: (i) an upright font (typeface), as opposed to slanted or italic font, or (ii) the numerals i, ii, iii, etc., or I, II, III, etc. ‘Indented’ will refer to the standard indent of 10pt (regardless of font size or text element) unless otherwise specified. A ‘vertical space’ will indicate a specified vertical space, which will then be inserted automatically by the class file; it is only necessary to mark the presence of a space, and therefore exact values are not given in this guide.

(b) *Slanted font*. The LMS journals use a slanted (sometimes called ‘oblique’) typeface instead of the usual italic typeface for all text matter that is not roman. For example, the slanted font is used for emphasis, for the text of section headings and for the text body of certain mathematical statements. In contrast, an italic typeface (different from the slanted one) is the standard font used for mathematical quantities (unless they are roman). Mark in particular the following to be set upright:

- (1) brackets and numbers within section headings, subsection headings and subsubsection headings;
- (2) numbers and brackets in citations, such as [**3**, *Theorem 4*] (the numbers will be typeset in boldface automatically);

- (3) within theorems and other slanted mathematical statements, mark numbers that refer back to sections, subsections, . . . , and to theorems and other mathematical statements, to be set upright, as in ‘*from Corollary 2.2 we have. . .*’.

See also § 7.6.2(f)

3. *Queries*

Author queries. A list of queries should be compiled on a separate sheet of paper attached to the end of the MS. The queries should then be given consecutive numbers Q1, Q2, etc. In the margin next to each query’s location in the MS, the copy-editor should insert the text ‘Q1’ (etc.), circle it, and provide an arrow to the precise location of the query.

The query should be formulated without reference to page or line numbers (these will be inserted later by the typesetter), but should give sufficient detail of the surrounding text for the author to be able to find the location within a few lines of text. Author queries should explain clearly what is being queried, and what is required from the author.

Incomprehensible English. For papers by authors with consistently tenuous command of English, mark changes wherever needed to improve the language. Use author queries for changes you are uncertain about, but only to alert the author to changes made and to ask whether they are acceptable. For incomprehensible phrases, if you can make a guess, always mark the change and query the author. If you are unable to guess the meaning, send any query regarding the meaning of incomprehensible phrases via email direct to the LMS Publishing Editor, who will forward them to the Honorary Editors when necessary. Note that an author query may not help, as the author may neither understand the problem nor be able to rectify it.

Occasional errors. In contrast, for papers by native English-speakers, but with an occasional garbled phrase, use an author query. In such papers, refrain from rearranging or recombining sentences and do not attempt to improve the style so long as the author’s version is acceptable. Mark only such changes in the MS as you are certain are not contentious and will not alter the mathematical meaning. For changes that you are uncertain about, but would wish to make, use author queries liberally to propose alternative wording and changes, but do not mark the changes in the MS.

Publisher queries. These should be sent via email to the LMS Publishing Editor, who can also answer queries about references to papers to appear in the *Bulletin*, *Journal*, *Proceedings*, *Journal of Topology* and *JCM*, as well as *Compositio Mathematica*.

4. *Gentle versus hands-on copy editing*

There are two categories of papers that require a special approach by the copyeditor.

(a) Papers by experienced authors who are confident in their use of English need to be handled with special care. In such papers, refrain from rearranging or recombining sentences and do not attempt to improve the style so long as the authors version is acceptable. Retain the authors numbering of mathematical statements and equations as far as is possible. Mark only such changes in the MS as you are certain are not contentious and will not alter the mathematical meaning. For changes that you are uncertain about, but would wish to make, use author queries liberally to propose alternative wording and changes, but do not mark the changes in the MS.

(b) Papers by authors with consistently tenuous command of English require a lot of hands-on help by the copy-editor. Examples include papers with missing articles (a, the) or plural

endings by authors whose native languages do not contain such grammatical structures, as well as papers with abundant foreign grammatical constructions. In such papers, mark changes wherever needed to improve the language. Use author queries for changes you are uncertain about, but only to alert the author to changes made and to ask whether they are acceptable. For incomprehensible phrases, if you can make a guess, always mark the change and query the author. If you are unable to guess the meaning, use a publisher query (see above).

PART II. OVERVIEW OF GENERAL CONVENTIONS

5. *Front matter and order of material*[‡]

Mandatory	Optional	Mark	Front matter	Cross-ref to Part III
✓		No	<i>Title-page header</i> [‡] , inserted by typesetter, containing coden, for example, ‘ <i>J. London Math. Soc.</i> (2) 00 (0000) 1–14’ copyright statement: ‘© 2007 London Mathematical Society’, and DOI, set as, for example, ‘doi:10.1112/jlms/jdm054’	
✓		Yes	<i>Title</i> of the paper, preferably not containing mathematical symbols or formulae	6.1
✓		Yes	<i>Author name(s)</i> [‡] (Note: no footnote symbols except for obit. notes)	6.2
✓		Yes	<i>Authors’ affiliation(s)</i> and correspondence address(es) [‡] go on the final page (see (vi) below) together with their names (repeated).	6.18
✓		Yes	<i>Dedication</i> (to be approved by editor; include in publisher queries).	6.4
✓		Yes	<i>Abstract</i> [‡]	6.5
✓			(1) The abstract should be included in the article.	
✓			(3) No references should be cited in the abstract; however, author surnames and book or journal reference (not paper title) may be given in full.	
✓			(4) No figures, tables, expressions, equations, numbered statements or sections of the MS should be cited in the abstract.	
	✓	Yes	<i>Table of contents</i> , ONLY for very long (or survey) papers and if provided by the author, and then only (Parts and Section headings)	
✓			<i>First page footnotes</i> [‡]	6.6
✓		Yes	Dates of first receipt, and of last revision (if applicable)	6.6(a), 7.7(b)
	✓	Yes	Obituary note	6.2, 6.6(b)
✓		Yes	2000 Mathematics Subject classification code(s)	6.6(c)
	✓	Yes	Grant or funding acknowledgements (raise author query, if not provided)	6.2, 6.6(d), 6.15
	✓	Yes	<i>Running head</i> [‡] (fewer than 50 characters, including spaces)	6.3

([‡]For BLMS Obituaries, Reports and Book Reviews, special rules apply.)

Material for the rest of the paper is published in the order:

- (i) *main body* (Sections, Subsections, . . . , with figures and tables appearing as soon as possible after first mention; the very first line of the paper is not indented);
- (ii) *appendices* (but if written by different authors, they should go after the acknowledgements); see § 6.14;
- (iii) *acknowledgement(s)*; see § 6.15;
- (iv) *note added in proof* (if present); see § 6.16;
- (v) *references*; see § 6.17;
- (vi) *author addresses*; see § 6.18.

PART III. DETAILED CONVENTIONS USED

6. *Text elements*6.1. *Paper title*

The title is in sentence case (no closing full stop). Formulae and symbols in the paper title are permitted but discouraged; do not edit any formulae out of the title. (See, however, § 7.4(d).) In long titles, mark line breaks to achieve balanced lines, with the last line not being longer than the first line.

6.2. *Author names*

(a) Author names are centred, capitalized as the authors have them, and separated by commas and ‘and’, as appropriate.

(b) Any author name can include initials, full forenames, or a combination of the two, as the authors have given them, in the order used by the authors (including, for example, Chinese practice).

(c) Authors’ names should not normally include titles or qualifications. Special honorifics may exceptionally be included (for example ‘Sir’).

(d) No footnote symbol (except for an obituary symbol[†] for an author who has died) should be attached to an author’s name; see § 6.6(d).

6.3. *Running heads*

(a) The paper’s title appears on each recto and the author names appear on each verso, except that the last page of each paper always uses a title running head. The running head is centred, all in capitals, except formulae and symbols, which are set in mixed cases. Author forenames should use the same spelling and/or initials as on the first page, but names can be changed to initials if necessary to fit all the authors into the running head. For many or long author names, mark what should be the running head (possibly including ‘*ET AL.*’, slanted, in capitals).

(b) The running title should be 50 characters or fewer. If necessary, shorten and query with the author.

6.4. *Dedication*

(a) Suitable dedications are allowed, but they have to be approved by the editors, so query the publisher if the approval is in doubt.

(b) Dedications should be set in the main text font and size, slanted, centred under the authors’ names. There should be no concluding stop (except when the dedication is a complete sentence). Slanted numbers are allowed in dedications if they are non-mathematical, as in ‘*70th birthday*’.

6.5. *Abstract*

(a) Abstracts should be less than 200 words.

(b) Abstracts may be written in the third person or in the first person. If there is excessive repetition of ‘we’, ‘our’ or ‘us’, then selected sentences can be re-written in the third person to improve the flow. Always include an author query when this is done. Avoid otherwise rearranging or recombining sentences, as this could change the mathematical meaning.

(c) The first line of the first paragraph is not indented, but first lines of subsequent paragraphs are.

(d) Abstracts can contain displayed maths or lists if absolutely necessary. They should not, however, contain reference citations, footnote symbols, figure, table or equation numbers or mathematical statement numbers. In lieu of a reference citation, authors' surnames and a book or journal reference (not paper title) may be given in full.

6.6. *First-page footnote*

The first-page footnote should be set under a full-width rule. It usually comprises the following four elements, in the order given, and the received/revised dates and subject classification must always be present (except for Obituaries, Book Reviews and Reports; see Appendix A). Each element starts on a new line, with the first line of each indented.

(a) The received/revised dates should be included as follows:

Received 10 October 2004.

Received 10 October 2004; revised 9 May 2005.

(b) If there is an obituary note, it is set under the received line, starting with '†'. The note could be, for example, 'Obit', which is Latin for 'he (or she) died', followed by a date (upright) and a full stop.

(c) At least one classification code from the most recent Mathematics Subject Classification scheme of *Mathematical Reviews* and *Zentralblatt für Mathematik* should then be given as follows.

2000 *Mathematics Subject Classification* 47D25.

2000 *Mathematics Subject Classification* 47D25, 47D20 (35S27).

2000 *Mathematics Subject Classification* 47D25 (primary), 47D20, 35S27 (secondary).

The classification codes can be viewed at <http://www.ams.org/msc/>.

(d) Any acknowledgements for grants and financial support for the research in the paper can then be included, with a point at the end. Because footnote marks are not permitted (see §6.2(d)), use 'The second author' (or the author's name) if necessary to distinguish between authors. (See also Subsection 6.15 for notes on acknowledgements.) Raise the following author query if funding information is not provided: 'Please consider whether you would like to acknowledge the support of any funding bodies. If so, please provide a brief funding statement to appear as a footnote on the first page of your paper'.

6.7. *Paragraphs*

Any paragraph that follows directly on from a section heading should begin flush left. The first sentence of the abstract and first paragraph of text in each paper should begin flush-left, even if it is not preceded by a heading. All other paragraphs should be indented, except after displayed maths if the paragraph has not been concluded. This needs to be indicated to the typesetter.

6.8. *Parts, sections, subsections, subsubsections and appendices*

In headings, use sentence case (note that identifiers are always in roman). Part headings in very long papers are in small caps; all other section headings are slanted. Any brackets or numbers appearing in a heading must be marked to be typeset upright.

The numbering of sectional units (including Appendices) follows the pattern shown in detail in Appendix B. Follow the author in terms of levels of numbering, unless there are glaring errors and/or inconsistencies. 'Section 0' should not be used; if necessary the *Introduction* may be left un-numbered, to avoid re-numbering. If the paper starts with an untitled section, this can be named *Introduction*.

Parts are referred to in the text as 'Part I' (capital 'P'). In slanted text, it is referred to as '*Part I*' (the roman identifier is upright). Note, in contrast, that 'p' in 'part (i) of the theorem' is lower-case.

Sections are referred to in the text as ‘Section 2’ (preferred, with capital ‘S’) or (if not at the beginning of a sentence) as §2 (§§ 2, 4), not ‘Sec. 2’, but note ‘in a previous section’ (no cap.). If the ‘§’ symbol is used, then a ‘thin space’ should be marked between it and the section number(s) at first instance. Section numbers run on regardless of any interspersed PART heads.

Subsections are referred to in the text as ‘Subsection 1.3’, § 2.3, etc. Groups of short numbered subsections without captions should be typeset in the style of subsubsections (see below) carrying the subsection number.

Numbered subsections without a caption can be set in the style of a subsubsection. The text follows on directly, and turnovers are flush left. Captions may be omitted if the author has been consistent in this. Subsubsections are referred to as ‘Paragraph 1.1.2’ (preferred) or ‘§ 1.1.2’. If an upright numerical identifier is inserted into the caption, this format can be used for, *inter alia*, numbered *Case* and *Step* headings (for example, within a proof).

Appendices take a Section heading (centred, with slanted caption). The default style is Appendix A, Appendix B, etc., but a single appendix should have no identifier ‘A’. The identifiers A, B, etc., are always in roman, even when referred to in slanted text. If a single appendix has no caption, the heading is ‘*Appendix*’ (again see Appendix B.1).

§ 6.14

6.9. Lists

(a) *Numbering.* Follow the author regarding the numbering of items in lists as long as it is consistent and there is no risk of confusion, but in appendices, force the convention (A.1), (A.2), (A.3), . . . (B.1), (B.2), . . . , etc. However, in papers where displayed expressions are numbered (1), (2), etc., there may be confusion if list items are numbered the same way, so change the numbering to either (i), (ii), . . . or (a), (b),

(b) When the numbering of list items is inconsistent, or to replace bullet points with numbered items, use the default numbering, which is as follows.

In normal text, when there is no risk of confusion with numbered expressions, use (1), (2), . . . at the top level, followed by (i), (ii), . . . at the second level (that is, a list within a list), and (a), (b), . . . at the third level.

Inside mathematical statements and proofs the default is to use (i), (ii), . . . at the top level, followed by (a), (b), . . . at the second level, and (1), (2), . . . at the third level.

(c) *Alignment.* The house style prescribes two different types of alignment for numbered lists. A flush-turnover list (`{flushenumerate}`) is used when all items of the list are complete sentences. A hanging-indent list (`{enumerate}`) is used when all items of the list are (incomplete) phrases. Either type of list can occur nested within a list of the same type or of the other type. Mark up accordingly: ‘flush’ or ‘hanging’, for example.

(1) This is the first item of a list that consists of complete sentences, and for that reason the turnover is flush with the left margin.

(i) This is the first item of a nested list, also of complete sentences.

(ii) $A = \emptyset$.

(iii) This is a long complete sentence in a list at the second level, and the turnover is flush with the left edge of the widest identifier, ‘(iii)’.

(2) This complete sentence includes the nested list below, which has the following items:

(i) a first item that is an incomplete phrase;

(ii) a second item that is an incomplete phrase and for that reason has a hanging-indent turnover, aligned with the first word of text in the first line.

The items in any given list should be either all sentences, or all phrases. List items that are complete sentences should start with an initial cap and end in a point. The text before such a list should end with a point, not a colon. Avoid starting a sentence with a symbol, unless there are no words at all. List items that are phrases should start with a lower-case character

and end in a semicolon, except for the last item, which should end in a point. The text before a list of phrases should end in a colon.

6.10. *Mathematical statements*

6.10.1. *Main statements.* (a) At the beginning of mathematical statements, the type of statement, for example, ‘THEOREM’, should be in small caps with an initial full cap, indented. The type should be followed by the statement identifier, for example, ‘THEOREM 1’, a point and a 1 *em* space.

(b) Copy-editors/typesetters should NOT renumber mathematical statements if the original numbering is logical and consistent. However, if the numbering is not consistent, one of the following numbering systems can be used:

THEOREM 1.1, LEMMA 1.2, THEOREM 1.3, PROPOSITION 2.1, THEOREM 2.2
 (where the number before the point is the section number)
 THEOREM 1, LEMMA 2, THEOREM 3, PROPOSITION 4
 THEOREM 1, LEMMA 1, THEOREM 2, PROPOSITION 1
 THEOREM 1.1, LEMMA 1.1, THEOREM 1.2, PROPOSITION 1.1, THEOREM 2.1
 THEOREM A, LEMMA B, THEOREM C, PROPOSITION D

There are occasional variations: a statement may be reproduced from an earlier paper (often in the introduction), and may not be in the numbering sequence (for example, ‘THEOREM A’ or ‘THOMPSON THEOREM’ or ‘SEPARATION THEOREM’), and sometimes authors give the paper’s main result in the introduction as ‘MAIN THEOREM’. The introduction may in this way contain identical copies of theorems proved later in the paper, sometimes with the identical (out-of-order) numbering. In such a case, always replace out-of-order headings such as ‘THEOREM 4.1.’ with ‘THEOREM (Theorem 4.1).’ or, if the author uses a different numbering system in the introduction, for example, ‘THEOREM A (Theorem 4.1).’

(c) If there is a reference citation in the statement, it should appear after the statement identifier (and before the point) as follows:

THEOREM 1 [3]. *If H is a ...*

THEOREM 2 (Jones [3, Lemma 1.1]). *If H is a ...*

(d) The text of some mathematical statements should be slanted, and the others should be roman, as follows:

<i>Slanted text</i>	Roman text (*except when followed by a proof)	
COROLLARY	CLAIM*	CONJECTURE
LEMMA	EXAMPLE*	PROBLEM
PROPOSITION	HYPOTHESIS	REMARK
THEOREM	NOTATION	NOTE
	OBSERVATION	QUESTION
	NOTATION	LIST
	ALGORITHM	PROPERTY
	ASSERTION*	
	DEFINITION (except for the actual word(s) defined, which are set as slanted)	
	FACT*	

In the slanted statements, all numbers, brackets and braces are roman, but commas, semicolons, colons, etc., follow the overall style of the statement. Maths is italic or roman as it would be in

roman text, and words within displayed maths are slanted or roman within slanted and roman statements, respectively, although mathematical abbreviations (see Subsection 7.4(e)) should be roman in displayed maths when they are part of a mathematical expression.

(e) If the statement has parts, it should be laid out as follows.

THEOREM 3. *Let J be a prime nondegenerate normed Jordan algebra. Then the following properties hold for $x < X$.*

(i) *If a is in A and satisfies $a < A$, then the mappings from J into A are continuous, and L denotes the set of*

(ii) *If, on the other hand,*

The properties are all

THEOREM 4. (i) *If a is in A and satisfies $a < A$, then the mappings from J into A are continuous, and L denotes the set of*

(ii) *If, on the other hand,*

The properties are all

The author's lead should generally be followed in terms of the layout and punctuation, using the templates shown above as the default. It is very important that the sense should not be altered.

The parts of mathematical statements can be numbered as '(i) . . .', '(a) . . .' or '(1) . . .' (in general, follow the author). Roman numerals (i), (ii), etc. are preferable, as there is then less chance of statement parts being confused with expression numbers and list items. The parts should be referred to in text as 'part (i)' etc. (or condition (i), property (i), etc.). In slanted text, they are referred to as '*part (i)*', etc. Part identifiers are always upright. See also § 6.10.4(b).

In EXAMPLES and REMARKS with long parts, a vertical space can be marked between each part to make it easier for the reader to distinguish between them. Where there are several examples and/or remarks under one heading, there may be a vertical space after each. (Copy editors may use their discretion on hanging indents and line spacing according to the length and type of list, as well as consistency within the paper; see the discussion on lists in Subsection 6.9. It may make sense to use, say, a 3-pt extra space rather than a full line space.)

(f) A vertical space will be typeset automatically above and below the statement, so this does not need to be marked.

6.10.2. *Proofs.* (a) Proofs begin with the word '*Proof*' (lower-case, initial cap), slanted and indented, and followed by a point and a 1 *em* space). If the proof of a statement does not start immediately after the statement, the name of the statement should be included in the leader, for example, '*Proof of Theorem 1.1.*' If the author has not included the word '*Proof*', and there is a short statement to the effect, for example, that the proof is obvious, then there is no need to include '*Proof*'. Otherwise, it should be inserted.

(b) The text of the proof should be roman.

(c) Proofs should end with an empty square box symbol '□', set flush right on the last line of the proof. If the last line is an unnumbered displayed equation, then the proof-end symbol should align with that equation; if that equation is numbered, then the proof-end symbol needs to go on the following line (unless equation numbers are set on the left). The proof should be followed by a vertical space.

(d) If a proof has parts, there should be a vertical space between them. The first line of each part should be indented; see Paragraph 6.10.1(e) above. The parts typically start as one of the following:

Case 1:

(1)

(1) \Leftrightarrow (2):

Headings such as ‘Case’ and ‘Step’ (see Paragraph 6.10.3) should be marked ‘\paragraph*’ for the benefit of the typesetter. If there is no text in the proof before the first part, then *instead* the first-part identifier should be marked to follow the word ‘Proof’ as follows:

Proof. (1) The first condition . . .

□

If Case 2 comes before Case 1 in a proof, do not rearrange. The numbers may directly correspond to parts or cases of the theorem that is being proved, and it may be necessary to prove these out of order.

Refer to, for example, ‘case (1)’ in the text.

(e) Sometimes an author will include lemmas etc. within a proof. This can be left, but make sure that the reader can see where the proof ends.

6.10.3. *Non-mathematical statements.* (a) Cases and Steps should start ‘Case 1’ or ‘Step 2’, respectively (lower-case, with an initial cap), heading slanted and indented, with 1 *em* space and an identifier (upright) followed by a point and a 1 *em* space. If there is a caption, for example, ‘genus 2’, it should be roman except for maths, the point should be replaced by a colon, and the caption should be followed by a point. The text should always be roman and should follow directly on the same line:

Case 1: $x = 2y$. In this case, . . .

A very short ‘Note’ can be included exceptionally, usually between a theorem and its proof, and should then be set in the same way; however, the mathematical statement NOTE should be used for a more substantial note (see §6.10.1(d)).

(b) The line spacing should be as for remarks and examples (see §6.10.1(e)).

6.10.4. *References to mathematical statements in text.* (a) Mathematical statements should be referred to in the text by name, for example, as ‘Theorem 1’, ‘the Main Theorem’, etc., rather than ‘the last theorem’. The statement name should have an initial cap if it is a specific named statement, and it is slanted/roman depending on the surrounding text. Do not refer to, for example, ‘2.1’ or ‘(2.1)’; always use ‘Corollary 2.1’, etc.

(b) A statement part should be referred to as, for example, ‘Proposition 2(ii)’ (or ‘Proposition 2(ii)’ in slanted text). Note that the part number is closed up to the identifier and that both are always upright.

6.11. *Mathematical expressions*

(a) Expression numbers for displayed expressions such as equations should be within parentheses, ranged right. Left-justified numbering may be allowed when the author uses the same numbering sequence for expressions as for statements or sections. If a multiline expression is one long sentence (with, for example, a series of equals signs), then its number should be aligned with the last line (if on the right; top line if on the left). If it is a series of ‘sentences’ with commas or semicolons between, then the number should be centred vertically beside the relevant lines ‘{gather}’.

(b) Authors sometimes number whole phrases or sentences containing maths as if they were expressions. This should be left within reason, and the text should be displayed as if it were an expression.

(c) Expressions can be numbered either consecutively throughout the paper or by section, that is, (1), (2), ... or (1.1), (1.2), ... where the first number is the section number. If an author has used a strange but logical numbering system, it should be left intact. If it is mixed, it can be changed. Avoid ‘numbering’ by Greek letters, mixed numbering schemes, or any other system that makes it difficult for the reader to refer back to expressions.

(d) Start the continuation text flush left if the paragraph has not been concluded.

(e) Numbered expressions should be referred to in text either as ‘equation (2)’ or, if there is no ambiguity, ‘(2)’. If arabic numerals are used both for equations and list-item identifiers, the word ‘equation’ must be included to avoid confusion. Authors may refer to numbered expressions as ‘inequality (3)’, ‘expression (4)’, ‘identity (5)’ or similar; this is permitted and should be left alone. Ranges are referred to as ‘expressions (1)–(5)’. Note that ‘equation’ (and ‘inequality’, etc.) is lower-case, except when it starts a sentence and ‘Equation’ is required, and that the identifier is always roman.

6.12. Figures

§ B.3

(a) Every figure in a paper should be numbered, and should be referred to in the text by its number, for example ‘Figure 1’.

(b) However, diagrams consisting of maths and arrows should normally not be marked as figures; include them as displayed expressions, which may be numbered or unnumbered. They cannot normally be moved, and are best considered as displays. Very large ones can be exceptions if they would cause copy-fitting problems, just as the matrices mentioned in § 6.13(g) can.

(c) The figure caption style is as follows.

FIGURE 1.
FIGURE 1. *Slanted title.*
FIGURE 1.1. *Slanted title.*

The caption should be centred under the figure. It is preferable for each figure to have a title, rather than just the figure number. The font size is 9 pt.

If a figure has several parts, these can have subcaptions if necessary, centred under the relevant part, above the main caption, as follows.

(i) $t < 0$

(i)(a) *The diagonal case*

Note that there is no point after a subcaption, the identifier is roman, and any text in the subcaption is slanted.

Multiline captions. For a narrow figure, one long line can be broken into two lines. In a caption with two lines, the lines should be centred below each other, of equal length or the bottom line shorter. If a figure caption cannot fit in two lines (9 pt font size), first see if lengthy explanations can be moved into the main text. If this is impractical, please mark the caption ‘`\longcaption`’. It will be typeset in an invisible box with a standard left and right indent and both left and right alignment.

(d) Graphs should be labelled with labels under the horizontal axis and to the left of the vertical axis. Short vertical-axis labels should be horizontal, and longer ones should be vertical, orientated so that it can be read if one’s head tilts to the left. The axes should meet at a point (no overlap), and there should be two 0s if appropriate. Graphs should not be boxed. Graphs should not be changed in line with these rules, however, without consulting the author.

(e) A computer printout that is a figure can be reproduced as it stands if it is important that the reader sees the output of the program, provided that the quality is good enough.

(f) Any lettering should be marked so that it agrees in style with lettering used in the main text and so that the font size is legible (the default is 8 pt, but 9 pt is acceptable).

6.13. Tables

§ B.4

(a) Every table in a paper should be numbered and should be referred to in the text by its number, for example, ('... Table 1', or '... *Table 1*' in slanted text) with the number always upright.

(b) The table caption style is as follows:

TABLE 1.
TABLE 1. *Slanted title.*
TABLE 1.1. *Slanted title.*

(c) The caption should be centred above the table. It is preferable for each table to have a title, rather than just the table number; query with the author if necessary. The font size is 9 pt. For multiline captions, see § 6.12(c).

(d) There should be horizontal rules above and below the column heads and at the base of the table. With care, take out horizontal rules in the body of the table, if necessary inserting extra white space. There should be no vertical rules except in special circumstances (such as a matrix). The most important factor, however, is general presentation and clarity. The default is to centre columns if they do not fill the full width.

(e) Table column heads should be lower-case, initial cap, roman, centred over the column.

(f) Table footnotes should be set immediately under the table, in 8 pt font size, to the full width of the table. The first line should be indented, and the turnovers should be flush left. There should be no footnote symbol if the footnote is linked to the caption of the table, or to the whole of the table. If the footnote refers to an item in the table, the usual footnote symbol(s) (†, ‡) should be used (and co-ordinated with any other footnotes on that page).

(g) Usually, only items that are tables should be called tables. However, there may occasionally be an object (such as a matrix) that is so large that it will have to be laid out away from its position in the text, and the only practical solution may be to call it a table. A computer printout that is a table can be reproduced as it stands if it is important that the reader sees the output of the program, provided that the quality is good enough. There should normally be a rule above and below the table, extending over the full width of the table. There may also be partial rules, spanning a few columns only, to indicate subheadings.

(h) An *en* rule can be used (with care) to represent an empty entry in a table column.

6.14. Appendices

(a) Appendices should be treated as an ordinary section of the paper, with a section head, positioned at the end of the paper, before acknowledgements and references. If an appendix is written by a different author, it may be positioned after the acknowledgements.

(b) The appendix section head should be as follows:

Appendix A. *Caption of one of several appendices*

Appendix A

Appendix. *Caption of a single appendix*

Appendix

6.15. Acknowledgements

(a) Acknowledgements, when given after a separate heading, begin with the word '*Acknowledgements*', or '*Acknowledgement*' if it contains only one (lower-case, initial cap, slanted and

indented). Simply mark this ‘acknowledgement(s)’ as appropriate; the typesetter will do the rest.

(b) Acknowledgements to people and referees, ongoing financial support of authors, and other assistance belong under this heading, though authors may prefer to include a brief funding acknowledgement in the first-page footnote, or in long papers may include acknowledgements at the end of the Introduction; again mark this ‘acknowledgement(s)’.

6.16. *Note added in proof*

If the author adds extra material at proof stage, it is added to the paper immediately above the references, beginning with the words ‘*Note added in proof, Month year.*’ Simply mark this ‘noteinproof’; the typesetter will do the rest.

6.17. *References*

6.17.1. *Reference order.* (a) The references are ordered by the alphabetical order of the authors. Within that, by date. Within that, if several of the references have the same date, the order is journals, books, preprints. Within that, the ordering is the author’s.

(b) If ‘VAN’ etc. has been spelled out with an initial capital as part of the author’s name, the reference should be ordered under ‘V’ etc. ‘VAN’ or ‘DE’, however, would be ordered under the spelling of the main name – ‘VON NEUMANN’ is ordered under ‘N’. Names should be ordered as spelled, not as they would be if spelled out (for example, ‘MC...’).

(c) For references with oriental authors, follow the author. If in doubt, send a publisher query.

(d) The references should be numbered consecutively when in the above order.

(e) Authors’ names normally consist of their initials and surnames (not full forenames or initials with more than one letter, such as ‘TH.’), but follow the author. Initials of Russian authors may be YU, YO or YA. Accents should be retained on small caps.

(f) For discrepancies in spellings and dates between the reference list (bibliography) and the main text, follow the reference list and query the author.

(g) Do not replace multiple authors with *et al.*, in the reference list or in text. Where *et al.* has been used by the author, it should be slanted.

6.17.2. *Reference style.* The rules of thumb for formatting bibliographies can be briefly described as follows:

(a) Names of *authors* appear in small caps (that is, not editors of volumes, unless the whole text is being cited).

(b) The name of the physical, published entity in which something appears (that is, the book, published proceedings volume or journal) appears in a slanted font. (A *year* or *date* appearing as part of such a name also appears as slanted, as do cardinals, as in ‘*The 12 Hilbert problems*’, but maths numbers are roman, as in ‘*Surfaces of genus 2*’.) Exceptions to slanted names are unpublished conference publications, theses/dissertations, preprints and documentation (which could be described as not having been ‘published’ in the same sense as journals or textbooks) — these are all in roman.

(c) *All* other text is ordinary roman (including punctuation and ‘and’ in author/editor groups. The only bold text is that used for the citation numbers.

(d) The various sections of each item are separated by commas (*outside* any inverted commas), except:

- a single space (no comma) before page numbers;
- a single space (no comma) before parentheses;
- a single space (no comma) between a series name and number;

- a single space (no comma) between a journal name and volume number (part numbers are not normally included here);
- a semicolon between the editor of a book or conference proceedings and the publisher, if these are juxtaposed;
- parentheses round publisher details of a book: (editor if appropriate; Publisher, Place, year);
- parentheses round the editor(s) of a book within a series;
- parentheses round language information, for example (Russian), where the title is given in English.

(e) If a part (that is, issue) number is needed, for example, for a journal where each part starts with page 1, it should be set immediately before the page numbers as follows: ‘no. 3,’ (there is no comma preceding it).

(f) The name of a specific paper, article or chapter title is in single quotes.

(g) Use initial capital letters for words in journal abbreviations, conference titles, proper nouns and book series names; otherwise one initial capital only (titles of books, papers, theses, chapters, . . .). (Beware German, though, which uses extra initial caps for nouns, and no initial caps for adjectives, as in the journal abbreviation *J. reine angew. Math.*)

(h) Use standard abbreviations for journal names; see <http://www.ams.org/msnhtml/serials.pdf>.

(i) Do *not* use ‘in’ before book and proceeding titles.

(j) Use ‘(ed.)’ or ‘(eds)’ (no full stop for the latter) immediately following the main referenced names, when these are the names of series or volume editor(s) and the whole work is being referenced. For an article in an edited book that is part of a book series, ‘(ed. E. Editor),’ should be placed between the book’s name and that of the book series; if there is no series name/number, ‘ed. E. Editor;’ should commence the parenthesis containing the publisher information.

(k) Give page spans in full; do not use ‘pp.’.

(l) If url addresses are given, these come at the end. It is preferred to mark them on a new line if this is needed to avoid breaks. Do not justify the previous line if this would lead to unsightly white spaces between items. Break the url, if necessary, after a slash or a full stop. Occurrences of tilde (\sim) should be marked ‘`\sim`’. Mark slashes ‘/’ to be changed if they are set as a maths solidus (too tall).

(m) Each item ends with a full stop.

6.17.3. Examples of references. (a) Articles in journals

1. F. ALLEN, ‘A paper accepted for publication’, *Invent. Math.* 12 (Year) 12–24.
2. G. BROWN, ‘Yet another paper’, *Some Journal*, to appear.
3. K. ERDMANN, ‘Algebras and dihedral defect groups’, *Proc. London Math. Soc.* (3) 54 (1987) 88–114.
4. K. ERDMANN, K. LUX, MULLER and M. RINGE, ‘Peakword condensation and sub-module lattices’, *J. Symbolic Comput.* 17 (1994) 529–544.
5. A. FRÖHLICH ‘Galois module structure and root numbers for quaternion extensions of degree $2n$ ’, *J. Number Theory*, to appear.
6. V. V. USPENSKII, ‘On the topology of free locally convex space’, *Izv. Math.* 62 (1996) 123–134 (Russian), *Soviet Math. Dokl.* (1997) 45–54 (English).
7. D. E. WILLIAMS, ‘Separating sets by Fourier transforms’, *J. Funct. Anal.* 59 (1984) 254–292; erratum, *J. Funct. Anal.* 61 (1986) 141.
8. J. ZEMA and M. YOR, ‘Temps locaux’, *Astérisque* 52–53 (1978) 3–16.
9. G. ZKUYAMA, ‘A-hypergeometric ranks’, *Int. Math. Res. Notices* 2006 (2006) 70814, doi:10.1155/IMRN/2006/70814.

References that are merely ‘submitted for publication’ are very strongly discouraged; they should be listed as Preprints (see Paragraph 6.17.4 (‘Incomplete references’)).

Journal names should be abbreviated in accordance with the American Mathematical Society publication *Abbreviations of Names of Serials reviewed in Mathematical Reviews*; see <http://www.ams.org/msnhtml/serials.pdf>.

(b) *Books, and articles in them*

1. A. N. AUTHOR, *How to write a bibliography* (Publisher, Place, Date).
2. A. N. AUTHOR and B. ANONYMOUS (eds), *More on bibliographies*, Imaginary Publisher's Series Imaginary Number in Series (Publisher, Place, Date).
3. J. H. CONWAY, R. T. CURTIS, S. P. NORTON, R. A. PARKER and R. A. WILSON, *Atlas of finite groups* (Clarendon Press, Oxford, 1985).
4. P. LANDROCK, *Finite group algebras and their modules*, 4th edn (Cambridge University Press, Cambridge, MA, 1983) Chapter II.
5. C. JANSEN, K. LUX, R. A. PARKER and R. A. WILSON, *An atlas of Brauer characters*, vol. II (Clarendon Press, Oxford, to appear).
6. R. PARKER, 'The computer calculation of modular characters', *Computational group theory* (ed. M. D. Atkinson; Oxford University Press, Oxford, 1984).
7. J. P. MAY, F. QUINN and N. RAY, 'E_∞ ring spectra', *E_∞ ring spaces and E_∞ ring spectra*, Lecture Notes in Mathematics 577 (Springer, Berlin, 1977) 63–86.
8. J. ZEMA and M. YOR, 'Temps locaux', *Astérisque* 54 (1979).

Note in the last example that *Astérisque* is considered a journal (for which publisher information need not be provided); however, it frequently devotes an entire issue to an article (so that no page numbers are needed).

Book series names should normally not be abbreviated. Their full names are usually listed on <http://www.ams.org/msnhtml/serials.pdf>.

(c) *An individually authored chapter within a book or volume of conference proceedings*

1. B. ANONYMOUS, 'Chapter on whatever', *How to write a bibliography* (ed. A. N. Editor; Publisher, Place, Date) 1–34.
2. C. BLOGGS, 'Paper on something else', *Proceedings of Some Conference on Something*, Tokyo, 1998 (eds D. Jones and E. Smith; Publisher, Place, Date) 35–60.
3. D. JONES, 'Article of interest', *Some book* (ed. C. Bloggs), Imaginary Publisher's Series Name (Publisher, Place, Date) 61–75.
4. J. MARTINET, 'Character theory and Artin L-functions', *Algebraic number fields*, Proceedings of the Durham Symposium 1975 (ed. A. Fröhlich; Academic Press, London, 1977).
5. S. B. PRIDY, 'On $\Omega^\infty S^\infty$ and the infinite symmetric group', *Proceedings of Symposia in Pure Mathematics* 22 (American Mathematical Society, Providence, RI, 1971) 217–220.
6. E. SMITH, 'Another interesting paper' (Russian), *Another book*, Another Series Name with a Number 365 (Publisher, Place, Date) 76–94.

Note that the title of the book is missing in [2] and [5] above; it should be queried with the authors (although the name of the conference series may turn out to be the title, to be set slanted).

(d) *Documentation*

1. M. RINGE, 'The C-meet axe', documentation, RWTH Aachen, 1992.
2. M. SCHONERT (ed.), *GAP-3.3 manual* (RWTH Aachen, 1993).

(e) *Dissertations*

1. H. AUTHOR, 'A thesis on something', PhD Thesis, Institution, Place, Date.
2. C. JANSEN, 'Ein Atlas 3-modularer Charaktertafeln', Dissertation, RWTH Aachen, 1995.
3. G. L. G. SKIJPEN, 'Convolution measure algebras on semigroups', PhD Thesis, Catholic University, Nijmegen, 1976.

(Note PhD does not have full stops.) At end of the reference, where relevant, for dissertations only: '(in preparation)'.

(f) *Preprints*

1. C. JANSEN and R. A. WILSON, 'Two new constructions of the O'Nan group', Preprint 94/15, University of Birmingham, 1994.
2. C. JANSEN and R. A. WILSON, 'Two new constructions of the O'Nan group', Preprint, 2003, arXiv:math.AG/0312296.

3. C. JANSEN and R. A. WILSON, ‘Two new constructions of the O’Nan group’, Preprint, 2003, <http://www.math.yale.edu/publications/~jansen/paper.html>.
4. C. JANSEN and R. A. WILSON, ‘Very short’, Preprint, 2003, <http://www.math.yale.edu/publications/~jansen/paper.html>.
5. R. J. MILGRAM, ‘Evaluating the Swan finiteness obstruction for periodic groups’, Preprint, Stanford University, 1978.

(g) *Website*

1. The GAP group, ‘GAP—groups, algorithms and programming, version 4.3’, 2002, <http://www.gap-system.org>.

6.17.4. *Incomplete references.* Incomplete references should be queried with the author. ‘Preprint’ on its own is not considered adequate; the institution (or arXiv reference, or web url) and year are required. Exceptionally, ‘Unpublished manuscript, year.’ can be tolerated. Full publication details are preferred. Papers listed as ‘in preparation’ should instead be inserted into the text as ‘work in progress’ or ‘in a forthcoming paper by...’, except when there is more than one citation that cannot be easily removed. Items listed as ‘private communication’ should similarly be inserted into the text.

6.17.5. *Reference citations.*

(a) In the main text, reference numbers are enclosed in square brackets. Citations of references should be in accordance with the following examples:

- ... other methods [4, 8, 9]
- ... other methods [4, 8–12]
- ... by Jones [2]
- ... by Jones [2, Theorem 3.6] (in slanted text)
- ... $q = dx/dy$; see [2, Theorem 3.6, p. 326]. (See (c) below.)
- ... (cf. [2, Theorem 3.6, pp. 326–387]).
- ... by Jones [2, Theorem 3.6, pp. 326, 327]
- ... can be found in [13, Chapter 2 (‘Selecting the functions’)]
- ...; see [3, Figure 2, p. 582; 4, Figure 11.5H, p. 654].
- ... by Jones [2, Theorem 3.6]; by Green [3]; see [4, 8, 9].
- ... Jones [6, 2.3]
- ... Jones [7, (2.4)]
- ... Jones [8, VI].

(b) Always spell out ‘Theorem’ etc. in full in citations, i.e. do not use “Th.” etc.

(c) Insert ‘; see’ or ‘(see ...)’ when a citation would otherwise follow directly on a mathematical formula.

(d) References *must* be cited in the main text; query the author if they are not.

(e) Citations such as [6, 2.3] (referring to a subsection), [7, (2.4)] (referring to an equation) and [8, VI] (referring to a chapter) are allowed. There is no need to insert the words ‘Subsection’, ‘equation’ or ‘Chapter’ (unless already provided by the author), and the author should NOT be asked to supply such words.

6.18. *Author affiliations*

In each address field, the name(s) and postal address are given in slanted font, followed by a vertical space and (if present) email address(es) in roman (on successive lines). The word ‘Email’ should not appear. Occasionally, an author may provide a web address, which can be set as the second line of an email address (but mark any ‘tilde’ to be set as ‘\sim’).

(a) *Author names.* The first line of each address field should contain the name(s) of one or more author(s). The authors’ names should appear with the same spelling and/or initials as they do on the first page. Author names with a shared address should be separated by ‘and’ and commas if needed.

(b) *Order and format.* If a paper has two authors with different addresses, the two addresses should be positioned side by side in the order of the authors' names at the beginning of the paper.

For more than two addresses, the addresses should be arranged as follows:

1	2
3	4

A single address may be set as wide as necessary, ignoring the column restrictions required by multiple addresses.

(c) *Addresses.* Each (set of) author name(s) should be followed, on the next line, by the first line of the address, with no added space in between.

Addresses should not be punctuated at the end of lines. There should be no points after caps in acronyms. Abbreviations should not normally be used in addresses.

The country names should be the English variants, and the rest of the address should be as the author has given it (in terms of language). For British addresses, 'United Kingdom' should be used, with postal codes on a separate line before it, and 'USA' should be used for the United States. Zip codes should be used for US states (for example, use 'MA' rather than 'Mass.' or 'Massachusetts'), run on after the city name. Delete 'Scotland', 'Wales', 'Northern Ireland' and use 'United Kingdom'.

If an author has two addresses, they should be set one above the other (if there is room), either separated by a 3 pt vertical space, the word 'and' and another 3 pt vertical space, or, if relevant, the lower one being preceded by '*Current address:*' or '*Present address:*'.

(d) *email addresses.* After the address and a vertical space, the email address (if there is one) should be given as follows, in roman:

s.rock@demon.co.uk

In cases of multiple authors sharing the same address, the email addresses should be listed in order, on separate lines. If it is not absolutely clear which email address applies to which author, the mailing address may be repeated.

6.19. Footnotes

(a) Footnotes should be avoided whenever possible, and short footnotes should be inserted back into the main text, for example, between round brackets. Instead of long footnotes, a separate, unnumbered REMARK statement can be used.

(b) Footnotes should be clearly marked and separated from the text by a ruled horizontal line at the bottom of the relevant page. The first line of each footnote should be indented, and turnovers should be flush left. Where there are several footnotes on one page, each footnote should start on a new line. The entire footnote should be on the same page as the footnote mark.

(c) Each footnote should start with the superscript footnote symbol. The footnote symbols should be the standard marks (dagger, double dagger), which start anew on each page. Do not use any symbol that is used for some other purpose in the main text.

(d) Do not use a footnote mark in displayed material such as titles or authors' names; the only exception is the 'obit' footnote for an author who has died. Never attach a footnote mark to a formula or mathematical symbol. The footnote symbol goes before punctuation.

7. Main text

7.1. Syntax, sentence construction and word use

(a) Mathematics should be written in grammatically correct language and should be properly punctuated, even in sentences that include displayed matter. Discreet and preferably

minor modifications should be made if the author has not managed to meet these standards, but the editor should be careful to avoid altering the mathematical sense.

(b) Words such as ‘assume’, ‘suppose’, ‘show’ and ‘imply’ should usually be followed by ‘that’ before a phrase containing a verb, but there should be no ‘that’ if ‘assume’, ‘suppose’, ‘show’ or ‘imply’ is followed by an equation or relation such as $a = b$ or $b > c$.

(c) Where ‘if’ introduces a conditional clause, it should usually be followed by ‘then’, for example, ‘if $x = 3$, then $y = 4$ ’. If there is no ‘then’, there should be a comma; however, ‘then’ is compulsory if omitting it would cause the juxtaposition of formulae, as in ‘if $x = 3$, $y = 4$ ’, where the comma could be misread as ‘and’.

(d) Adjectives should not usually be used without their accompanying noun (for instance, ‘the unitary’ should not be used when what is meant is ‘the unitary operator’; ‘(the) Frobenius’ should not be used when what is meant is ‘the Frobenius automorphism’). However, it is correct to use some common mathematical adjectival terms, such as ‘Hamiltonians’ and ‘Laplacians’, on their own if the addition of a noun could change the meaning. Always query the author about any noun you insert.

(e) Certain non-standard English phrases that are used by mathematicians should be left as they are, for example ‘associated to’, ‘has size at most’, ‘has measure’; these can be recognized with experience.

(f) Papers may be written in the first person, and the use of ‘we’ in papers that have only one author is acceptable. ‘I’ may be used in the acknowledgements.

(g) Sentences should begin with words rather than symbols. Phrases such as ‘It follows that’, ‘Since’, ‘We have’, ‘We see that’, ‘We find that’, ‘Now’ and ‘The function’ can be inserted to avoid sentences starting with maths and to avoid formulae being separated only by a comma (see (h)). In a list of mathematical terms that contains no words, each list item can be made a phrase rather than a sentence (see Subsection 6.9 regarding lists).

(h) Formulae should never be separated by punctuation marks only, except in a list. (It may sometimes be difficult to implement this because of the complexity of the maths, or the construction of the expressions. The meaning of the mathematics should not be changed to achieve this.)

(i) Quotation marks should not be adjacent to formulae, and reference citations and footnote symbols should not be immediately next to maths: use ‘ $\dots = f$ (see [3])’, not ‘ $\dots = f$ [3]’. Do not use ‘apostrophe s’ for the possessive with symbols (use ‘of’). Do not use apostrophes or hyphens with ‘*ith*’ etc. Do not use apostrophe for decades such as the 1960s or plurals of acronyms such as PDEs. Do not make formulae plural with an ‘s’; for example, replace ‘the f_i ’s’ with ‘the functions f_i ’. If unsure what plural noun is needed, insert ‘objects’ and query the author, explaining that apostrophe is not allowed.

(j) Edit to avoid ambiguity. For instance, do not use an asterisk or superscript number as a footnote symbol; use [†] and [‡] as the default (starting anew on each page). However, avoid footnotes wherever possible (see § 6.19). If equations and parts of mathematical statements are both numbered (1), (2), etc., consider marking the parts with roman numerals (i), (ii), etc., or always refer to ‘part (1)’ (with lower-case ‘p’) rather than ‘(1)’ to avoid confusion.

7.2. Punctuation

(a) If there is a reference citation or footnote symbol at the end of a sentence, this falls within the punctuation.

(b) Follow the author’s style on hyphens, making it consistent throughout the paper when it varies. Use hyphens for compound adjectives, including ‘2-dimensional’, but follow the author when the hyphen would be followed by mathematics: ‘level 2 surface’ and ‘level-2 surface’ are both acceptable, but should be used consistently.

(c) Quotation marks should be single, with double inside if necessary, then single, and so on. Double quotation marks can be used when quoting direct speech.

(d) Parenthetical dashes should be avoided wherever possible, and should never be adjacent to mathematics. Pairs of dashes can be replaced with round brackets or commas. A single dash can be replaced with a comma, a semicolon, a colon or a full stop. If essential, use a spaced *em* rule. This should be marked.

Closed-up *en* rules are used:

- for the coupling of two or more names or ideas, for example, A–B interaction, C–D equilibrium, Smith–Jones hypothesis (but Harish-Chandra, who is one person, with a hyphen, similarly ‘Levi-Civita’);
- in the place of ‘versus’, for example, pH–activity curve;
- to signify ranges, for example, 1–3 hours, 22–40 K.

(e) Displayed expressions should end in a full point if they are at the end of a sentence; if the displayed expression is a diagram in which punctuation could confuse, then complete the sentence before the diagram. Expressions can also end in a comma if essential for the sense, as in an ‘if ... then’ statement; the editor should judge whether or not a comma will add to clarity and intelligibility. An expression followed on the next text line by, for example, ‘where $x = 7$ ’ may need a comma; the copy editor should use his or her discretion. (See § 7.6.2 for notes on how to punctuate a displayed line.)

(f) Change decimal comma to decimal point (on the line).

7.3. Spelling

(a) Authors may use US spelling (behavior, center, and single consonants before ‘ed’ , for example, ‘modeled’); the default spelling in papers by authors from neither country is British (unless the author is Canadian, in which case it suffices that the spelling is consistent throughout the paper).

(b) The OED is the final authority for British English spelling (apart from the following LMS preferred spelling):

program (‘a computer program’, as against ‘a research programme’).

(c) For plurals of Latin and Greek words, follow the author. If the author has been inconsistent, the preferred spelling is to use the Latin and Greek plurals (for example, ‘formulae’) except where such words have been absorbed into the English language and the Latin or Greek plural is never used.

(d) For words such as ‘Abelian’, ‘Cartesian’, ‘Euclidean’, ‘Hermitian’, etc., follow the author in terms of initial caps, but check for consistency. The default spelling uses initial capitals. If caps are used in compounds, this type of word should be in the following format: ‘hyper-Hopfian’, ‘metabelian’, ‘non-Abelian’ (or ‘non-abelian’).

7.4. Abbreviations

(a) Abbreviations should be used as seldom as possible, except in the references.

(b) The only exceptions are ‘cf.’, which is normally left because authors tend to use it not exactly in the sense of ‘compare’, and ‘etc.’. Use ‘for example’ and ‘that is’, not ‘e.g.’ and ‘i.e.’. ‘(F)or example’ should normally be preceded by a semicolon or a full stop and followed by a comma if it introduces a complete phrase; otherwise it should normally have commas on both sides. ‘(T)hat is’ should normally have commas on both sides or should be preceded by an opening bracket and followed by a comma; precede it with a semicolon when a full stop would work equally well.

(c) The unabbreviated form of ‘respectively’, ‘Theorem’ and ‘Corollary’ (and so on) should be used. Change ‘iff’: use ‘if and only if’ in text, and ‘ \Leftrightarrow ’ in formulae. Delete definitions of abbreviations if they are not used.

(d) Do not use symbols such as ‘ \exists ’, ‘ \forall ’, ‘=’ and ‘<’ as abbreviations in text (unless they are within an inline formula). A binary relation such as ‘=’ or ‘<’ should have a mathematical

quantity on each side; otherwise replace it with text, for example, ‘at most’ (*‘au plus’*) for ‘ \leq ’, ‘at least’ (*‘au moins’*) for ‘ \geq ’, ‘belongs to’ for ‘ \in ’, ‘is a (true) subset of’ for ‘ \subseteq ’ (*‘ \subset ’*), ‘is isomorphic to’ for ‘ \simeq ’ or ‘ \cong ’, ‘contains’ for ‘ \supset ’, ‘ \supseteq ’ or ‘ \ni ’. Also note ‘2 or lower’ (≤ 2); ‘3 or higher’ (≥ 3). Always query the author about the change.

(e) The common mathematical abbreviations should not be used in text (unless they are within an in-line formula and are defined at first instance). An abbreviation can be left in a displayed expression (upright, as an operator), but it should then be defined in the next text line, the first time it appears. Examples are as follows:

a.C.M.	arithmetically Cohen–Macaulay
a.e. (*)	almost everywhere, almost every*
a.p.	approximation property
a.s.	almost surely
c.d.	cohomological dimension
l.i.	linearly independent
nef	numerically effective (note: no points!)
p.v.	principal value (PV is allowed if it immediately precedes an integral sign)
r.v.	random variable
u.f.d.	unique factorization domain
v.p.	valeur principale (so should be ‘p.v.’ or ‘PV’, see above, unless paper is in French)
	(* this abbreviation may be used also in text, if the author has done so)

The following abbreviations should always be written out in full:

w.l.o.g.	without loss of generality
w.r.t.	with respect to.

Non-English speakers will sometimes use the version of these abbreviations that is used in their own language, and so these in particular need to be changed (via author query if necessary; see ‘v.p.’ and ‘p.v.’ above), as they will not be understood by subscribers of other nationalities. Non-English-speaking authors also sometimes use these abbreviations for similar, but not identical, terms. For instance, they may use ‘a.e.’ to mean ‘almost every’, as opposed to ‘almost everywhere’, so be careful to determine exactly what they mean.

When the common mathematical abbreviations are used in expressions, they should be lowercase with points (with occasional variations such as ‘a.C.M.’, which contains surnames, and ‘nef’).

7.5. *Slanted and upright text*

(a) The text of some mathematical statements, for example theorems, is set in a slanted font (a full list is given in §6.10). In the slanted statements, all numbers, brackets and braces are roman, but commas, semicolons, colons, etc., follow the overall style of the statement. Maths is italic/roman/calligraphic/blackboard bold as it would be in roman text. These passages must be marked according to Section 2.

(b) Where a word is first defined within roman text, even if not in the context of a mathematical statement, it should be in a slanted font. Conversely, where a word is first defined within slanted text, even if not in the context of a mathematical statement, it should be in a roman font. For this reason, slanted (or roman) text for emphasis is allowed only sparingly. It is not always easy to make isolated definitions slanted consistently if the author has not already done so, so follow the author wherever possible, and correct any inconsistency. ‘DEFINITION’ statements should always contain the defined word or phrase in a slanted font, unless it is a symbol that is being defined.

(c) Brackets and braces are always roman, in any element of the paper. Numbers are roman everywhere except in the references, in author addresses and in dedications, where special rules apply.

(d) In ‘*ith*’ etc., ‘*i*’ is math-italic, and ‘*th*’ is roman. There is no space, hyphen or apostrophe. (If the whole text is slanted, then ‘*i*’ should be marked ‘`mathit`’ and should be distinguished from ‘*th*’, which is slanted.) Note also ‘ $(m + 1)$ th’ and ‘ (i, j) th’.

(e) Latin terms in roman text are slanted in accordance with the rules in *Hart’s Rules for Compositors and Readers/Oxford Guide to Style* (and ‘*et al.*’ is slanted). Other foreign words that have not been absorbed into the English language should be slanted, except that foreign words that have become accepted mathematical terms (for example, ‘*étale*’, ‘*adèle*’ and ‘*idèle*’) are roman.

7.6. Mathematics

7.6.1. *Mathematical notation.* An editor should not change the author’s mathematical notation unless it is absolutely necessary. Even then, it should probably be raised as a query. Notation varies in accordance with mathematical fields, and what seems like an insignificant editorial change may in fact change the mathematical sense of a statement.

7.6.2. *Mathematics markup.* (a) Mark up the first incidence of any symbol that could be ambiguous (see (c) below) and any unusual symbol using a conventional editorial system (for example, the `LaTeX` command corresponding to the symbol, if you know it) that will be unambiguously clear to the typesetter. Explain the code at the beginning of the MS if necessary.

Follow the author’s punctuation in maths, where possible; in cases of confusion or inconsistency, the default is as follows. In displays, if there is more than one expression on one line, there should be a comma after each one except (possibly) the last, and additional (quad) space should be marked between the expressions. A comma is not necessary between an expression and a following ‘for all’ type small expression, but additional (quad) space should be marked between the two. If there is more than one expression in a ‘for’ type expression, they should be separated by a comma and a single space or by the word ‘and’ (when they are independent conditions) or ‘or’ (when they are dependent conditions):

$$\begin{aligned} A = BX & \quad \text{for } n < N, x > X, \\ A = BX & \quad \text{for } n < N \text{ and } x > X, \\ A = BX & \quad \text{for } n < N_1 \text{ or } n > N_2 \text{ (note: } n \text{ in both cases).} \end{aligned}$$

Do not replace words by symbols in this context (for example, ‘ \forall ’ for ‘for all’); this can change the meaning. In a list of cases following an equals sign and a brace, additional horizontal space should be marked between the expressions and any qualifiers, and the latter should be aligned vertically. Punctuate at the ends of lines of displayed expressions as appropriate (comma, semicolon or nothing) in the interests of clarity and sense.

(b) Maths can be roman or italic (normal or bold font), Greek, Calligraphic, Fraktur or blackboard bold (open-face). The italic math font is referred to as math-italic, and can be marked ‘`mathit`’ if necessary. Calligraphic, Fraktur and blackboard bold should be marked at first instance (‘`cal`’, ‘`Frak`’, ‘`mathbb`’).

Lower-case Greek should be italic, and cap Greek should be roman. (The typesetters know this, so it should not be necessary to mark it.) If slanted cap Greek has been used for a special purpose, this *must* be marked.

(c) Examples of symbols that should be distinguished are the following:

(d) Check that the use of either circular ‘ \emptyset ’ or upright \emptyset for the ‘empty set’ symbol is consistent; the same goes for ε vs ϵ , ϕ vs φ and θ vs \mathcal{V} if these are used to denote the same quantity.

(e) Three sizes of union sign are used: in text, small (as in ‘ $X \cup Y$ ’) or big (as in ‘ $Y = \bigcup\{X_i : i \in \Lambda\}$ ’ and ‘ $\bigcup_{i < k} Y_i$ ’ with limits to the side); in displayed expressions, small or big as

Σ	cap sigma	Σ	summation sign		
ε, ϵ	lower-case epsilon	\in	'belongs to'		
ϕ, φ	lower-case phi	Φ	cap phi	\emptyset, \varnothing	'empty set'
θ, ϑ	lower-case theta				
Π	cap pi	\prod	product		
o	lower-case math-italic 'oh'	O	cap math-italic 'oh'	0	zero
\circ	composition symbol	\circ	degrees		
x	lower-case math-italic 'ex'	\times	multiply		
v	lower-case math-italic 'vee'	ν	lower-case nu	\vee	small wedge
u	lower-case math-italic 'yu'	μ	lower-case upsilon		
U	upper-case roman 'yu'	\cup	small union		
n	lower-case math-italic 'en'	\cap	small intersection		
l	lower-case math-italic 'el'	ℓ	lower-case script 'el'	1	one
$'$	prime	1	superscript one		
1	subscript one	,	comma		
$\langle \rangle$	angle brackets	$< >$	inequality signs		

in

$$X \cup Y, \quad Y = \bigcup \{X_i : i \in \Lambda\} \quad \text{and} \quad \bigcup_{i < k} Y_i,$$

with limits below and/or above in displayed maths). Mark these 'small' or 'big' each time. The same applies to intersection signs (' \cap ') and Boolean sums and products (' \oplus ', ' \otimes ', ' \times ').

(f) *Roman/math-italic*: in general, follow the author, but check for indiscriminate italics. Parameters, functions and variables, generally

- if represented by one character, should be typeset math-italic;
- if represented by more than one character should be typeset as a roman word (this includes standard functions such as sin, cos, exp, Tr, Im, etc.) (see § 7.6.2 for detailed examples).

Thus, operators such as 'Aut', 'Clos', 'dim', 'dist', 'End', 'exp', 'Ext', 'Fit', 'Hom', 'Im', 'Inn', 'Ker', 'log', 'max', 'mod', 'Out', 'rad', 'Re', 'sin', 'soc' and 'Sym' should be roman. (Some of these can have an initial cap or be all lower-case.) If they are not followed by a bracket, then there should be a thin space between them and the next character.

(g) For vectors, matrices and tensors, do not change the author's notation (as long as it is consistent). The default is bold roman (for example, \mathbf{M} , \mathbf{T} , \mathbf{x}), but roman and single/double underline may also occur.

(h) The symbols 'e' (exponential) and 'i' (square root of -1) should be math-italic, and marked as such. The letter 'd' in, for example, ' dx/dy ' or in an integration measure (' dx ', ' $\int f dx$ ') is also math-italic.

(i) In maths, some combinations of characters that are not variables should be roman. Examples are as follows.

C^*	algebras	FP	
GF		GL	general linear group
ΓL		gl	general linear algebra
K3	Kummer, Kähler, Kodaira (note, however: K -theory)	L^2	(a Hilbert space) (note, however: L -theory)
PD	Poincaré duality complex	Pf	Pfaffian
PG	projective geometry	PGL	projective general linear group
PGL		PSL	projective special linear group
RP	real projective space (or RP)	SL	special linear group
sl	special linear algebra	SO	special orthogonal group
Sp	symplectic group	SU	special unitary group

However, these combinations of letters are not necessarily roman if they mean something else. The surrounding text may help to determine their meaning.

(j) Some characters are traditionally blackboard bold (openface) if they mean the following.

\mathbb{C}	complex numbers (also in CP)	\mathbb{Q}	rational numbers
\mathbb{N}	natural numbers	\mathbb{Z}	integers
\mathbb{R}	real numbers	$\mathbb{F}_p, \mathbb{F}_q$	p -adic field

(k) Authors who have used square root signs usually object if these are changed to $^{\prime}1/2^{\prime}$, so only change them if the complexity of the maths makes it essential, and query the change with the author. Square root signs should include a bar over the whole of the $\sqrt{\text{relevant expression}}$. If this causes problems with the line spacing, the expression with the square root may need to be displayed.

(l) Points indicating multiplication should be halfway up the x -height. Points indicating an omitted quantity between moduli $|\cdot|$ or an omitted function argument, as in $f(a, \cdot)$ or $\langle \cdot, \cdot \rangle$ should be halfway up the x -height. Decimal points should be set on the baseline.

Ellipses \dots should be set on the baseline and marked as such, except in the following circumstances, when they should be set as \dots half-way up the x -height:

(i) to indicate repeated multiplication if a single point \cdot at half-way x -height has been used elsewhere in the MS for multiplication (one may alternatively use \dots);

(ii) between horizontal arrows: $\rightarrow \dots \rightarrow$; $\leftarrow \dots \leftarrow$; etc.

(m) In maths, the position of all asterisks and points (that is, superscript, subscript, halfway up x -height) should be marked. Do not use asterisks for any other purpose (such as footnote symbols).

(n) For intervals such as $]a, b[$, where the author has intentionally incorporated brackets that are the ‘wrong’ way round, draw the typesetter’s attention to this at the first instance.

(o) Arrows (if they have no labels) should be 1 *em* long (mark ‘short arrow’) or 2 *em* long (mark ‘long arrow’); in general, follow the author. If the arrows are ugly or inconsistent, the default is as follows. Arrows denoting convergence (for example, $n \rightarrow \infty$, $t \rightarrow 0$) should always be 1 *em*. Otherwise, arrows should normally be 1 *em* long in text and 2 *em* long in displayed expressions (diagrams). The same rules apply to ‘implies’ and ‘if and only if’ (\Rightarrow , \Leftrightarrow); when displayed, these should have a quad space on either side. A correctly set 1-*em* arrow need not be marked unless it looks ‘long’ in the MS, in which case mark it. All labels to arrows should be set in a smaller font, and the length of the arrow should be increased to accommodate the label if necessary.

In diagrams with horizontal, vertical and sloping arrows, the spaces between formulae and arrows should be uniform (about 5 pt); *horizontal* arrows should be *vertically* centred on the main symbol of each formula (halfway up from its baseline). *Vertical* arrows should be *horizontally* centred on each formula.

(p) The typesetter will usually ignore any spacing to the left of a punctuation mark, even if it is clearly there in the MS, so mark such spaces clearly at the first instance, and ask for them to be inserted throughout. Examples are spaces on both sides of colons in mappings (for example, $X : A \rightarrow Y$), and colons and vertical bars in expressions such as $X = \{\sum AB \mid y \in Y \text{ and } z < Z\}$. Pairs (for example, ‘the parameters u, v ’) should have a thin space between them. If an author has inserted spaces that should be removed, mark these also.

(q) Note the difference in the use of a vertical rule ‘|’ to denote ‘such that’, ‘divides’ or ‘restricted to’. ‘Such that’ appears inside set descriptions (that is, within curly braces):

$$X = \left\{ \sum AB \mid y \in Y \text{ and } z < Z \right\}.$$

‘Divides’ and ‘does not divide’ (\nmid) are verbs, as in

‘if $a \mid b$ then $b = xa$ for some integer x ;

if $a \nmid b$ then there is no integer x such that $b = xa$.’

In these cases, there should be a space on either side of | (or †); mark them ‘\mid’ or ‘\nmid’, respectively.

‘Restricted to’ is essentially an adjective and should be closed up to the symbols either side; mark this ‘\vert’. Some authors use a subscript after | rather than on-line type, and some use the L^AT_EXcode \upharpoonright; there should still be no space round the symbol in these cases:

‘the function $f|A$ maps $a \in A$ to $b \in B$ ’, or
 ‘the function $f|_A$ maps $a \in A$ to $b \in B$ ’.

The main way to distinguish ‘restricted to’ from ‘divides’ is that the former is never a verb, so there has to be another verb nearby; ‘divides’ is always a verb so there will not be another in the same clause.

(r) The typesetters will not be able to typeset third-order superscripts and subscripts in a smaller size than second-order ones: A_{BC_D} . If this causes problems with the line spacing (as it does here), the expression with the super- or subscripts may need to be displayed.

(s) Where superscripts and subscripts contain a division, they should be marked to be set on one line with a solidus ($x^{a/b}$); insert any necessary parentheses. Beware of mixed superscripts and subscripts containing spaces, as in ‘ $T_{\mu}^{\alpha\beta\gamma}$ ’. Mathematically, this is different from $T_{\mu\beta\gamma}^{\alpha}$, so mark the alignment carefully

(t) Small case fractions can be used in in-line maths ($\frac{1}{4}, \frac{3}{4}a$), but any other division should be marked to be set in-line with a solidus; insert any necessary parentheses. Also, in a display equation containing one or two simple fractions, but no other large symbols of fractions, `textstyle` fractions may be used:

$$\frac{1}{2}x = y^2 + \frac{3}{4}z.$$

(u) Reference citations and footnote symbols should not be immediately next to maths: use ‘ $a = f$ (see [3])’, not ‘ $a = f$ [3]’, where confusion can arise. Inverted commas should not be adjacent to formulae (the previous sentence is an example of incorrect use). Do not use ‘apostrophe s’ for the possessive with symbols (use ‘of’). Do not use apostrophe with ‘ith’ etc. Do not make formulae plural with an ‘s’; for example, use ‘the functions f_i ’. If unsure what plural noun is needed, insert ‘objects’ and query the author, explaining that apostrophe is not allowed. You may also write ‘the f_i ’, if it is clear from the context that i takes several values.

(v) Symbols should not be used in text instead of, for example, ‘for all’ or ‘there exists’. The symbols (‘ \forall ’ and ‘ \exists ’, respectively) should only be used near the end of a displayed equation or between braces in expressions in in-line maths. Where these symbols are used, there should be a space between them and the following maths.

(w) If any maths is too complex to be easily understood in-line, or it becomes so after editing, or it would be difficult to break in the appropriate places, then mark it to be displayed. If any occasional in-line maths would cause greater than standard line spacing, then mark that maths to be displayed (or mark limits to be moved to the side). Use small matrices ($\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}$) to fit simple matrices in-line; mark anything more complicated to be displayed. Note that expressions containing horizontal arrows with a sub- or superscript will not fit into in-line maths. If the MS contains a rapid succession of many small formulae that cannot fit within the standard line spacing, do not display them; instead, ask the typesetter to adjust the line spacing (‘the leading’) locally.

(x) Leave displayed expressions on lines as the author has grouped them, more or less (that is, however many expressions there are on one line). However, if the expressions (as laid out in the MS) obviously will not fit in the LMS style, if they are broken inappropriately, or if they look untidy or confusing as they are, then mark appropriate breaks and changes.

(y) Within a displayed expression, the first operator (for example, ‘=’) should be ranged vertically with other operators at the same level (for example, ‘=’, ‘ \leq ’, ‘ \subseteq ’, ‘ \simeq ’), and turnovers

with operators at a deeper level should be ranged to the first character after the operator in the first operator line above. Where lines are broken at, for example, a plus sign, the plus sign should start the second line. The typesetter should take care to insert the correct ('binary') spacing after the plus sign. Lines broken before the occurrence of a matching closing bracket should be ranged to the first character after the preceding unmatched opening bracket. Where several displayed expressions appear together, the above rules also apply (unless some of the maths will not fit). Avoid spurious alignments:

$$\begin{aligned} 2X &= Y(a + b) \\ &\quad + Yc + Yd \\ &= Y(a + b \\ &\quad \quad + c + d) \\ &\leq Y a + Y b + Y c + Y d \end{aligned}$$

but

$$\begin{aligned} x &= 5y; \\ y &= 2x - 43; \\ \sum_{n=1}^5 fx &= p + q + r; \\ \sum_{n=1}^5 f(0) &= 4. \end{aligned}$$

7.7. Numbers, dates and units

(a) Numbers should generally be written out in words from one to twenty in text (unless followed by units), though not in maths. Numerals should generally be used from 21 upwards; the key is consistency. Use a thin space as 1000 separator for more than four digits. (An exception should be made when the numbers are effectively the 'names' of representations of groups.)

(b) Dates should be in the format '17 July 1994', '17–23 July 1994'; the month should not be abbreviated. '1960s', etc., should have no apostrophe.

(c) There should be a space between the number and the units, unless the units are represented by a single symbol (for example, % and °).

Appendix A. *Special papers*

This appendix details the particular styles followed in the *Bulletin for obituaries, book reviews and reports*. The style of *surveys* is the same as that of ordinary research papers.

When special papers are included in an issue, the usual order is the following:

- 'SURVEY' (at most one per issue);
- 'PAPERS';
- 'OBITUARY' (at most one per issue);
- 'BOOK REVIEWS';
- reports (for example, 'HONORARY MEMBER', 'PRIZEWINNERS').

The corresponding headings are typeset in capital letters in the list of contents on the outside back cover.

There is also a section covering the editing and setting of papers in French (Section A.4).

A.1. *Obituaries*

- (a) On the title page, the ‘title’ is ‘OBITUARY’ (all capitals).
- (b) The full name and lifespan of the subject of the obituary replace the author name for a normal paper, as follows.

Departed Mathematician 1916–2001

(c) The photograph (if available) follows, normally about 9 cm high, depending on the quality of the picture and the need for sensible page breaks. Photo credits should be typeset vertically along the right edge of the photograph and 2 pt away from it, beginning at the lower right-hand corner, in 8 pt (footnote-size) mixed cases. The LMS may decide in individual cases whether the photo credit should begin with a copyright symbol ©.

(d) The *photograph itself* (ignoring the photo credit) is horizontally centred on the title.

(e) There is no abstract, although the photograph may be followed by an unnumbered section of text, or by a quote.

(f) A quote should be indented right and left and centred and should be typeset in a 9 pt slanted font. The first line of the quote should not have any additional indentation. Attributions to the source of the quote, if any, should appear below the quote, right-aligned with the quote: the name of the quote’s author should be upright, and the name of the quoted work (if present) should follow on the same line, slanted and preceded by a comma.

(g) The first line of the main text is set flush left, as in the usual house style. The first lines of subsequent paragraphs are indented, except where they follow a section heading.

(h) There are no first-page footnotes.

(i) The running head on a recto is ‘OBITUARY’; on a verso it is the name (in capitals) and lifespan of the subject.

(j) Obituaries are normally divided into (numbered) sections (‘1. *Life*’ and ‘2. *Work*’ are typical), with subsections as appropriate, following the house style. If there are many short subsections, then they should preferably be set in the style of subsections (see § B.1) carrying the subsection number.

(k) Usual style rules apply to both language and mathematics; however, obituaries that are re-published with permission from elsewhere must be edited with special care: in such cases, do not attempt to improve the style so long as the author’s version is acceptable.

(l) Obituaries normally include two separate lists of references.

(1) General references are listed first, under the heading ‘*References*’. These are cited in the text using a bold number in angle brackets (e.g. ⟨**1**⟩, ⟨**2**⟩, etc.). They are listed in normal bibliographical order and style (see § 6.17), except that each bibliography item is labelled with a bold number in angle brackets.

(2) The subject’s own works are listed separately, under the heading ‘*Publications of . . .*’, and are usually listed chronologically. They are cited in the text using the normal square-bracketed bold numbers [1], [2], etc., and the list is numbered with bold numbers, followed in each case by a point (as in a normal bibliography). For single-author works, the author’s name is omitted, and joint works are listed as follows.

1. (with A. N. OTHER and T. H. IRD) ‘Reference title’, etc.

The co-authors’ surnames have an initial cap, with the rest in small caps; in all other regards, the style is as described in § 6.17.

(m) The name(s) and affiliation(s) of the author(s) of the obituary appear at the end, in order; names and affiliations in slanted font, upper and lower case (affiliations usually only a single line) on the left. If the authors particularly wish it, full addresses (including email) may be included.

A.2. *Book reviews*

(a) Book reviews are collected in a ‘book review section’. Each review has its individual DOI number.

(b) On the title page of the book review section, the ‘title’ is ‘BOOK REVIEWS’ (all capitals, centred), or ‘BOOK REVIEW’ if there is only one.

(c) There are no first-page footnotes.

(d) The running head is ‘BOOK REVIEWS’ (or ‘BOOK REVIEW’).

(e) For each book reviewed, the information shown after this paragraph is printed at the head of the review. All but the last two lines are centred. Lines 1–6 are broken as appropriate to the text. The notation ‘(...(P))’ is used when it happens that there are both a hardback and a paperback version. If two or more books are covered in the same review, the pattern is repeated as necessary (with, obviously, only one copyright line and DOI number per review item).

Title of book under review, in 10-pt slanted text

(Name of series and number, followed by a line space)

By First Author and Second Author:

679 pp., US\$99.00/£50.00 (US\$24.00 (P))

ISBN 0-XXXX-YYYY-Z (ISBN 0-YYYY-XXXX-Z (P))

(Publisher, Place, Year).

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DOI: 10.1112/S002460930xxxxxxx

(g) The first line of each review is set left flush.

(h) Numbering of equations and references starts afresh with each new review. It is preferable but not mandatory to use either the style (1), (2), ... or (1.1), (1.2), ... throughout a set of reviews. Reference lists appear (if used) at the end of the individual reviews; follow the house style for setting of references (see § 6.17).

(i) The name(s) and affiliation(s) of the reviewer(s) appear at the end, in order; names and affiliations in slanted font, upper and lower case, on the left. Normally, only a single-line affiliation is used. Generally, a first name and surname are given, unless the reviewer particularly wishes otherwise.

(j) The style for both language and mathematics is as usual.

A.3. *Reports*

The formatting for reports (Honorary Members and Prizewinners) is based upon that for Obituaries.

§ A.1

A.4. *Papers written in French*

Papers written in French should be edited with regard to typeface and layout, but the sentence structure and grammar should not be meddled with, unless there is inconsistency and the copy-editor is very competent in the language.

The following points of style should be noted.

(a) For two or more authors, the word ‘et/ET’ should be used rather than ‘and’ between author names on the title page and in the running head. In other respects, the style of ‘ET’ is the same. However, ‘and’ should be used instead of ‘et’ in the list of contents on the outside back cover, as well as in the volume index.

(b) There should always be an English abstract, but a second abstract in French is permitted and should then have the heading ‘RÉSUMÉ’.

(c) In the footer, received and revised dates should be written in English, as should the *Mathematics Subject Classification* line. Any further footnote, such as funding acknowledgements, may be written in French if the author so wishes.

(d) The list of references at the end of the paper should be typeset as for a paper written in English. In particular, the heading should read ‘References’, not ‘Références’ or ‘Bibliographie’. In bibliography items, ‘et’ should be replaced by ‘and’ (lower-case), and expressions such as ‘à paraître’ should be replaced with ‘to appear’. French text within bibliography items, other than titles, should be queried and the author should be asked to translate them to English (for example, ‘2nd edn’ instead of ‘2^{ème} édition’).

(e) There should be an inter-word space both before and after every

- colon :
- semicolon ;
- question mark ?
- exclamation mark !

but not before (only after) a comma.

(f) Either French $\langle\langle$ quotation marks $\rangle\rangle$ or the standard English ‘inverted commas’ (or “double inverted commas”; see § 7.2(c)) are permitted. Follow the author, and make changes only if the author is inconsistent. French quotation marks are usually separated from the word(s) they enclose by a pair of spaces.

(g) A binary relation such as ‘=’ or ‘<’ should have a mathematical quantity on each side; otherwise ask the author to replace it with suitable text. See § 7.4(d) for a list of binary relations that may need to be thus clarified.

(h) Cross-references to mathematical statements or sectional units are made in French using one of the following two styles:

- (1) using lower-case nouns preceded by a definite article (or a genitive form); for example ‘voir le théorème 3.1’, ‘...suive du théorème 3.1’, ‘...suive de la proposition 4.2’, ‘voir les théorèmes 3.1 et 3.2’, ‘...suive des théorèmes 3.1 et 3.2’; do not remove any of the articles ‘de’, ‘du’, ‘des’, ‘la’, ‘le’, ‘les’ in these references, and do not put initial capitals on ‘théorème’ or ‘proposition’ in such references if they are consistently lower-case;
- (2) the same style as above, but references to a mathematical statement within the paper itself have an initial capital; references to mathematical statements within any other paper are lower-case.

Follow either of these two styles, as long as the author is consistent.

(i) In contrast to the style rules for citations in English papers (see § 6.17.5), expressions such as ‘suive de la proposition 3.1 de [14]’ or similar should *never* be replaced with ‘suive de la [14, proposition 3.1]’ or similar. Expressions of the type ‘voir [14, la proposition 3.1]’, with the article within the square bracket, are permitted if the author has used them, but *never* if they involve the genitive articles ‘de la’, ‘du’ or ‘des’.

PART IV. ADDITIONAL NOTES FOR TYPESETTERS

Appendix B. *Numbering, formatting and headings*

B.1. *Parts, sections, subsections, subsubsections and appendices*

In headings, use sentence case. The numbering of sectional units follows the general pattern below (note that identifiers are always in roman). Follow the author in terms of levels of numbering, unless there are glaring errors and/or inconsistencies. ‘Section 0’ should not be

used; if necessary the *Introduction* may be left un-numbered, to avoid re-numbering. If the paper starts with an untitled section, this can be named *Introduction*.

Any brackets () [] { } or numbers appearing in a heading must be marked to be typeset upright.

In long sections and part headings, mark line breaks sensibly to achieve balanced lines, with the last line not being longer than the first line.

PART I. TITLE OF PART (SMALL CAPS, CENTRED, NO CLOSING FULL STOP;
PRECEDED AND FOLLOWED BY A VERTICAL SPACE)

This is unusual and occurs only for very long papers; normally papers start their numbering at the ‘Section’ level. Parts are numbered with capital roman numerals I, II, etc. The subsequent paragraph is not indented. Parts are referred to in the text as ‘Part I’ (capital ‘P’). In slanted text, it is referred to as ‘*Part I*’ (the roman identifier is upright). Note, in contrast, that ‘p’ in ‘part (i) of the theorem’ is lower-case.

2. *Section head (slanted, centred, no closing full stop;
preceded and followed by a vertical space)*

The subsequent paragraph is not indented. Sections are referred to in the text as ‘Section 2’ (preferred, with capital ‘S’) or (if not at the beginning of a sentence) as §2 (§§2, 4), not ‘Sec. 2’, but *note* ‘in a previous section’ (no cap.). If the ‘§’ symbol is used, then a ‘thin space’ should be marked between it and the section number(s) at first instance. Section numbers run on regardless of any interspersed PART heads. If a section head falls at the top of a page, it will be automatically lowered by 12 pt to separate it from the running head.

1.2. *Subsection head (slanted, left flush, no closing full stop; preceded and followed by a vertical space)*

The subsequent paragraph is not indented. Subsections are referred to in the text as ‘Subsection 1.3’, §2.3, etc. Groups of short numbered subsections without captions should be typeset in the style of subsubsections (see below) carrying the subsection number.

1.2. Numbered subsection without a caption, set in the style of a subsubsection. The text follows on directly, as here.

1.1.2. *Subsubsection (slanted, preceded by a vertical space).* The heading is indented and ends with a full stop. The text follows on directly, as here, and turnovers are flush left. Captions may be omitted if the author has been consistent in this. Subsubsections are referred to as ‘Paragraph 1.1.2’ (preferred) or ‘§1.1.2’.

Unnumbered subsubsection (slanted, preceded by a vertical space). Again, the heading is indented, ends with a full stop and the text follows on directly. If an upright numerical identifier is inserted into the caption, this format can be used for, inter alia, numbered *Case* and *Step* headings (for example, within a proof).

Appendices take a Section heading (centred, with slanted caption). The default style is Appendix A, Appendix B, etc., but a single appendix should have no identifier ‘A’. The identifiers A, B, etc., are always in roman, even when referred to in slanted text. Below, note

the special style when a single appendix has no caption.

Appendix A. <i>Caption of one of several appendices</i> Appendix A Appendix. <i>Caption of a single appendix</i> Appendix
A.2. <i>Title of a subsection of Appendix A (or a single appendix)</i>
Numbering of expression in Appendix A (or in a single appendix): (A.1)

B.2. Lists

The identifiers of any list are right-aligned and the widest identifier is indented; for nested lists, the widest identifier is left-aligned with the first word of the parent list. For hanging indents, turnovers are aligned with the left-hand end of the first word. For flush turnovers, turnovers are ranged further left: at the top level, they go to the margin; at any lower level, they are aligned with the first word of the parent list.

Check that the vertical spacing (if any) before, after or within the list is consistent, and that it serves the sense of the material. If a new paragraph starts after the end of the list, the first line of that paragraph is indented. In the main text, a 6 pt vertical space can be marked before and after the list, but inside mathematical statements there should be no such spaces.

If necessary for clarity, turn horizontal lists within the text into vertical displayed lists. Follow the author for numbering, using round brackets on both sides of the indicator; the indicators (i), (ii), ... are preferred. Avoid (a), (b), ... except as subsets of (i). List indicators are always typeset upright, also when they are referred to in slanted text. Bullet points for unnumbered lists are allowed but not encouraged.

B.3. Figures (see § 6.12)

(a) The default position is at the top of a page. Figure captions appear below the figure, centred. ‘FIGURE *n*’ is in small caps and the caption in slanted font, followed by a full stop, thus:

FIGURE B.1. *Title of figure.*

(b) Subcaptions for parts of a figure are centred under the relevant items, above the main caption.

(c) Like tables, figures must have a number (1, 2, 3, ... or 1.1, 1.2, 1.3, ...), may have a caption and should be referred to in the main text (‘...Figure 1’, or ‘...*Figure 1*’ in slanted text). ‘Figure’ is always in full, and the number is always upright.

B.4. Tables (see § 6.13)

(a) In general, there should be no vertical lines in a table, and horizontal rules only at the head and foot (the width of the table), and to separate out headings and subheadings.

(b) The default position is at the foot of a page. Table captions appear above the table, centred, thus:

TABLE B.1. *Caption of table in slanted font; full stop at end. ‘TABLE’ in small caps.*

(c) Each table must have a number (1, 2, ... or 1.1, 1.2, 1.3, ...), may have a caption as well (preferred but not compulsory), and should be referred to in the main text ('... Table 1', or '*... Table 1*' in slanted text) with the number always upright.

Acknowledgements. This document is based on a style guide in Microsoft Word written by Sue Rodd, which is in turn based on a style guide written by Amanda Harper. The authors would like to thank Alice Sharp for helpful suggestions during the revision of these former guides.

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Checklist for the LMS House Style

Item	Reference
A: TEXT ELEMENTS	§ 6
<input type="checkbox"/> Paper title: correctly capitalized; good line breaks	§ 6.1
<input type="checkbox"/> Author names: no titles, correctly capitalized, no footnotes	§ 6.2
<input type="checkbox"/> Running heads: at most 50 characters	§ 6.3
Dedication (if any):	§ 6.4
<input type="checkbox"/> Approved by LMS?	
<input type="checkbox"/> Slanted font; no closing period unless a full sentence	
Abstract	§ 6.5
<input type="checkbox"/> Max. 200 words	§ 6.5(a)
<input type="checkbox"/> No cross links to items in the main text	§ 6.5(b)
<input type="checkbox"/> Bibliographic references: [Author surname(s), book/journal title]	§ 6.5(d)
First-page footnote:	§ 6.6
<input type="checkbox"/> Received/revised dates (dd Month yyyy; dd Month yyyy)	§ 6.6(a)
<input type="checkbox"/> Obituary note if applicable (exceptional); NO other footnote marks	§ 6.6(b)
<input type="checkbox"/> Maths classification code(s): XXXX (primary), YYYY (secondary)	§ 6.6(c)
<input type="checkbox"/> Funding acknowledgements	§ 6.6(d)
Non-indented paragraphs:	§ 6.7
<input type="checkbox"/> 1st para of Abstract	§ 6.5(c)
<input type="checkbox"/> 1st para of main text	§ 5
<input type="checkbox"/> Paras continuing after a display	§ 6.11(d)
Part/section heads	§ 6.8
<input type="checkbox"/> Part headers s.c., all others slanted (except numbers, brackets)	§ 6.8
<input type="checkbox"/> Consistent numbering; no ‘Section 0’	
<input type="checkbox"/> Appendices (if any) numbered according to style	§ 6.14
<input type="checkbox"/> If no numbered subsections have captions, query set as sub-subsections	§ 6.8
<input type="checkbox"/> Correct formatting for steps/cases	§ 6.10.3
<input type="checkbox"/> Correctly referred to in the text	§ 6.8
Lists	§ 6.9
<input type="checkbox"/> Consistent numbering system	
<input type="checkbox"/> ‘Flush’ lists have a full sentence before, and consist of full sentences ending in periods	
<input type="checkbox"/> ‘Hanging’ lists have a colon before and consist of phrases ending in semi-colons, with a final period	
Mathematical statements	§ 6.10
<input type="checkbox"/> Consistent and logical numbering system	§ 6.10.1(b)
<input type="checkbox"/> Reference citations (if any) correctly included within the statement name	§ 6.10.1(c)
<input type="checkbox"/> Slanted/roman according to whether there is a proof	§ 6.10.1(d)
<input type="checkbox"/> ‘Part (i)’ run on after title if no intervening text	§ 6.10.1(e)
<input type="checkbox"/> Correctly referred to in the text (‘Theorem 1’, <i>Lemma</i> 1.2(ii)’)	§ 6.10.4
Proofs	§ 6.10.2
<input type="checkbox"/> ‘Proof of ...’ if not immediately following the statement proved	
<input type="checkbox"/> Proof box (right flush) at end, level with final line (including displays)	
<input type="checkbox"/> Parts/cases/steps correctly set	§ 6.10.3
<input type="checkbox"/> ‘(i)’, etc., run on after ‘Proof.’ if no intervening text	
Figures	§§ 6.12, B.3
<input type="checkbox"/> Numbered and (preferably) captioned	§ 6.12(a)
<input type="checkbox"/> Small diagrams set as displays	§ 6.12(b)
<input type="checkbox"/> Captions correctly set (9 pt, centred)	§ 6.12(c)
<input type="checkbox"/> Default position is at the head of a page	§ B.3
<input type="checkbox"/> All figures referred to in the text	§ 6.12(a)
<input type="checkbox"/> Figure labelling (8 or 9 pt) matching the main text for fonts, italics, etc.	§ 6.12.0(f)

Checklist for the LMS House Style

Item	Reference
Tables	§§ 6.13 B.4
<input type="checkbox"/> Numbered and (preferably) captioned	§ 6.13(a)
<input type="checkbox"/> Captions correctly set (9 pt, centred)	§ 6.13(b)
<input type="checkbox"/> Default position is at the foot of a page	§ B.4
<input type="checkbox"/> All tables referred to in the text	§ 6.13(a)
<input type="checkbox"/> Table column heads: lower-case (initial cap), roman, centred	§ 6.13(e)
Displayed expressions	§§ 6.11, 7.6.2(x)
<input type="checkbox"/> Consistent numbering system (e.g., (1), (2), ..., or (1.1), (1.2), ...)	§ 6.11(c)
<input type="checkbox"/> No clash between numbering of displays and lists	§ 7.1(j)
Correct alignments:	
<input type="checkbox"/> lists of expressions: each line centred; eqn number centred vertically;	§§ 7.6.2(y), 6.11(c)
<input type="checkbox"/> continuous equations: aligned on operators or within brackets; eqn number at the end	§§ 7.6.2(y), 6.11(c)
<input type="checkbox"/> Consistent leading in running text, or need to set more maths as displays?	§ 7.6.2(x)
<input type="checkbox"/> Small matrices used in running text	§ 7.6.2(w)
<input type="checkbox"/> Small diagrams (e.g., arrow diagrams) set as displays, not Figures	§ 6.12(b)
<input type="checkbox"/> Labelling of arrows in diagrams set footnote size; arrows longer than labels	§ 7.6.2(o)
<input type="checkbox"/> Simple, number-only case fractions in displays with no other large symbols: set text style	§ 7.6.2(t)
<input type="checkbox"/> Appendices between main text and acknowledgements, unless written by separate authors	§ 6.14
<input type="checkbox"/> Acknowledgements immediately before Bibliography (preferred) or at end of Introduction in long papers (see first-page footnote also)	§ 6.15
<input type="checkbox"/> ‘ <i>Note added in proof, Month, year.</i> ’: immediately before the bibliography	§ 6.16
References	§ 6.17
<input type="checkbox"/> Ordered alphabetically by author, then by date (note ‘VAN’/‘VAN’)	§ 6.17.1
<input type="checkbox"/> Numbered consecutively	§ 6.17.1
<input type="checkbox"/> Correct style for journal paper/book/proceedings article/thesis/preprint	§ 6.17.2
<input type="checkbox"/> Incomplete refs queried with author	§ 6.17.4
<input type="checkbox"/> No ‘in preparation’ or ‘personal communication’ — take into main text	§ 6.17.4
<input type="checkbox"/> All references cited in the main text	§ 6.17.5
<input type="checkbox"/> Correct citation style: [1, 2], [3, Theorem 4], [5; 6, Theorem 7]	§ 6.17.5
Author affiliations	§ 6.18
<input type="checkbox"/> Names as on title page	§ 6.18(a)
<input type="checkbox"/> Order: $\begin{smallmatrix} 1 & 2 \\ 3 & 4 \end{smallmatrix}$	§ 6.18(b)
<input type="checkbox"/> No line space between names and addresses (both slanted)	§ 6.18(c)
<input type="checkbox"/> English country names; also, United Kingdom, USA	§ 6.18(c)
<input type="checkbox"/> Line space followed by email address(es) (roman)	§ 6.18(d)
<input type="checkbox"/> Single-author addresses can be set wider	§ 6.18
Footnotes	§ 6.19
<input type="checkbox"/> No footnotes on title-page authors (except obit.)	§ 6.2
<input type="checkbox"/> Take into text if possible	§ 6.19
<input type="checkbox"/> Table footnotes	§ 6.13
Special items	
Obituaries	§ A.1
Book reviews	§ A.2
Reports (Hon. Members, Prizewinners)	§ A.3
Papers in French	§ A.4

Checklist for the LMS House Style

Item	Reference
B: FONTS	§ 7.5
Small caps in:	
<input type="checkbox"/> Running heads	§ 6.3
<input type="checkbox"/> Math statement header names	§ 6.10
<input type="checkbox"/> Author names in bibliography	§ 6.17
Slanted font in:	§ 7.5
<input type="checkbox"/> Section and subsection headings	§§ 6.8, B.1
<input type="checkbox"/> Maths statements with proofs	§ 6.10.1(d)
<input type="checkbox"/> Defined words	§ 6.10.1
<input type="checkbox"/> Names of journals/books in bibliography	§ 6.17
<input type="checkbox"/> Non-maths numbers in bibliography book titles and author affiliations	§§ 6.17, 6.18
<input type="checkbox"/> Dedications	§ 6.4
<input type="checkbox"/> Foreign terms, following <i>Hart's rules</i>	§ 7.5
Roman (upright) font: main text plus:	§ 7.5
<input type="checkbox"/> Mathematical statements without proofs	§ 6.10.1(d)
<input type="checkbox"/> All brackets	
<input type="checkbox"/> Numbers, except within bibliography book titles and author affiliations	§§ 6.17, 6.18
<input type="checkbox"/> All identifiers (<i>Section 1, Case B, equation (3), part (iv), ldots</i>)	§ 6.8
<input type="checkbox"/> Operators ('lim', ...) and other multiple-letter maths symbols	§ 7.6.2(f)
C: LANGUAGE	§ 7.1
<input type="checkbox"/> Clear and unambiguous	§ 7.1(a)
<input type="checkbox"/> Sentences starting with words, not symbols	§ 7.1(g)
<input type="checkbox"/> No quotation marks or ref. citations adjacent to maths	§ 7.1(i)
<input type="checkbox"/> Correct use of single/double quotation marks	§ 7.2(c)
<input type="checkbox"/> Spaced em-rules for parenthetical dashes	§ 7.2(d)
<input type="checkbox"/> Consistent hyphenation	§ 7.2(b)
<input type="checkbox"/> Consistent use of either British (default) or American spelling	§ 7.3(a)
<input type="checkbox"/> Correct punctuation round display expressions	§ 7.2(e)
<input type="checkbox"/> No non-standard abbreviations	§ 7.4
<input type="checkbox"/> No abbreviations like 'Thm', 'Lem.', 'iff', etc.	§ 7.4(c)
<input type="checkbox"/> No maths symbols as text abbreviations, unless part of a formula	§ 7.6.2(v)
<input type="checkbox"/> No '... (resp...)' . sentence written out in full	§ 7.4(c)
<input type="checkbox"/> No 'whose' for non-human entities	§ 7.1(e)
D: MATHS MARKUP	§ 7.6
<input type="checkbox"/> Correct symbols unambiguously clear	§ 7.6.2
<input type="checkbox"/> Consistent use of '∅' vs. '∅'	§ 7.6.2(d)
<input type="checkbox"/> Correct size of '∪', '∩', '∑', '⊕', etc.	§ 7.6.2(e)
<input type="checkbox"/> Standard abbreviations/units; correct use of slanted/roman	§§ 7.6.2(i), 7.6.2(f)
<input type="checkbox"/> '·' for multiplication	§ 7.6.2(l)
<input type="checkbox"/> '...' for all ellipses except repeated multiplication and between arrows	§ 7.6.2(l)
<input type="checkbox"/> Limit arrows always 1 em;	§ 7.6.2(o)
otherwise arrows 1 em in text, and 2 em (or longer, if labelled) in displays	§ 7.6.2(o)
<input type="checkbox"/> Thin space either side of ':' or ' ' for 'such that'	§ 7.6.2(p)
<input type="checkbox"/> Fractions in super-/sub-scripts written in-line with a solidus ($x^{2/3}$)	§ 7.6.2(s)
<input type="checkbox"/> Simple, number-only case fractions in text;	
all other fractions in text set in-line	§ 7.6.2(t)
<input type="checkbox"/> Reference citations and quotation marks not next to maths	§ 7.6.2(u)
<input type="checkbox"/> No 'apostrophe s' for plurals of maths entities	§ 7.6.2(x)
<input type="checkbox"/> Thin space as 1000 separator	§ 7.7
E: AUTHOR QUERIES	§ 3
<input type="checkbox"/> Listed on a separate sheet	
<input type="checkbox"/> Unambiguous	