Tips for writing a maths report

Related to the maths…

1. Don't start a sentence with a symbol.
   Bad: $x^n - a$ has n distinct zeroes.
   Good: The polynomial $x^n - a$ has n distinct zeroes.

2. The statement just preceding a theorem, algorithm, etc., should be a complete sentence or should end with a colon.
   Bad: We now have the following
   Theorem. H(x) is continuous.

   Good: We can now prove the following theorem.
   Theorem 4.1. The function H(x) defined in (5) is continuous.

3. Be careful with punctuation, especially colons. The colon is used chiefly to introduce a list, quotation, or explanation following an independent clause (complete sentence).
   Incorrect use of colons:
   a). . . of "nonincreasing" vectors:
   $A_n = \{(a_1, \ldots, a_n) \in N_n \mid a_1 \geq \cdots \geq a_n\}$.

   b) If C and P are subsets of N_n, let:
   $L(C, P) = \ldots$

   c) We have: X=Y

   Correct use of colons:
   a) Define it as follows:

4. Symbols in different formulas must be separated by words.
   Bad: Consider S_q, $q < p$.
   Good: Consider S_q, where $q < p$

5. Capitalise names like Theorem 1, Lemma 2, Algorithm 3, Method 4.

6. Don't omit 'that' when it helps the reader to understand the sentence. The words 'assume' and 'suppose' should usually be followed by 'that'.
   Bad: Assume A is a group.
   Good: Assume that A is a group.

   Bad: We have that x = y.
   Good: We have x = y.

7. Use the word 'we' to avoid passive voice (as as 2.). 'We' should be used in contexts where it means 'you and me together', not a formal equivalent of 'I'. Think of a dialog between author and reader. In most technical writing, 'I' should be avoided.

8. Do not use the word 'get' or 'obtain'. Definition (Webster) = To come into the state of having, become the owner of reveiver of. You arrive at conclusions, equations, etc. by the process of thinking, deducing, reasoning…

9. The words ‘so that’ convey purpose, whereas ‘such that’ imposes a condition

10. Filler words such as ‘We remark that’ and ‘Note that’ should be avoided.

More general points…

11. Perhaps the most important principle of good writing is to always keep the reader in mind: What does the reader know so far? What does the reader expect next and why?

12. The opening paragraph should be your best paragraph, and its first sentence should be your best sentence.

    ~~An important method for internal sorting is quicksort.~~
    Quicksort is an important method for internal sorting, because . . .

    ~~A commonly used data structure is the priority queue.~~
    Priority queues are significant components of the data structures needed for many different applications.

13. Sentences should be readable from left to right without ambiguity. Put the subject/most important information at the start of the sentence.

    ~~Smith remarked in a paper about the scarcity of data.~~
    Smith remarked about the scarity of data in a paper.

    ~~In the theory of rings, groups and other algebraic structures are treated.~~
    Groups and other algebraic structures are treated in the theory of rings.

14. When describing the work of other people you can state that it is ‘interesting’ or ‘remarkable’; but it is better to let the results speak for themselves or to give reasons why the things seem interesting or remarkable.

15. In general, don’t use jargon unnecessarily. Even specialists in a field get more pleasure from papers that use a nonspecialist’s vocabulary. Avoid colloquialisms and slang.

16. Use quotation marks sparingly.

17. Avoid ambiguous pronouns

    ~~Two things about the derivation are worthy of note. First, it’s a great convenience to be summing . . . .~~
    Two things about this derivation are worthy of note. First, we see again the great convenience of summing . . . .

18. Avoid the word ‘shall’; it is considered formal by today’s generation of mathematicians.

19. Avoid the word ‘will’ in the outline of your report – use the present tense.

    ~~We will describe this methods in Chapter 6.~~
    This method is described in Chapter 6

20. Avoid contractions such as ‘don’t’ in formal writing

Bibliography

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