BO1.1. History of Mathematics
Lecture Course Summary

TT26 Week 2

The following sides give an indication of some of the major themes that we encountered during the lecture course (but do not consider them to be exhaustive). These broads themes are the types of things that you will be asked about in the exam, and will provide a framework within which you should be able to cite a small range of specific examples to illustrate the points that you are making.

17th-century change

Initial ancient bias gradually giving way to new ideas:

- symbolic notation
- analytic geometry
- other new ideas: infinitesimals
- general methods for finding tangents, areas, volumes
- calculus

Ongoing discussion of what constitutes ‘proper’ mathematics

18th-century formalisation of analysis

A major theme was the development of calculus/analysis:

- The uses and abuses of calculus
- Challenge problems
- Crystallisation of new concepts (functions in particular)
- Foundational difficulties

19th-century rigorisation of analysis

Continuing with analysis:

- Further formalisation of concepts
- What counts as rigorous mathematics?
- New frameworks: ϵ/δ, set theory

But situating it within wider trends (not just confined to the 19th century):

- Growing abstractions
- Move away from geometrical intuition
- Professionalisation
- Changes in publication practices

Changes over time

Reorientation of disciplines, for example:

- Analysis — problem-solving $\rightarrow$ rigour
- Algebra — equation-solving $\rightarrow$ structure

Formation and acceptance of new ideas or disciplines, for example:

- Number theory
- Linear algebra
- Complex numbers

Recommendation

- Start with the ideas — what they were and how they changed over time
- Be able to name the relevant people, what they did, and where it fits in