1. **Description of the task.**

   Compile a **set of notes**, of **no less than 1200 words and no more than 3000 words in English**, on **either Topic (A) or Topic (B)**, based on a **study of the respective prescribed text**:

   - **Topic (A). Construction of the real number system.**
     Prescribed text:
     Chapters 8-10, with emphasis from the section *Construction of real numbers* (Page 200) onwards, of *The Foundations of Mathematics* (Second Edition), written by I. Stewart, D. Tall and published by Oxford University Press.
   - **Topic (B). Cardinal numbers and ordinal numbers.**
     Prescribed text:
     Chapters 5-6, with emphasis from Section 5.5 onwards of *The Mathematics of Infinity* (Second Edition), written by T. G. Faticoni and published by Wiley.

   The prescribed texts for the respective topics are a piece of abstract and theoretical mathematics, of a **difficulty level at the top-end in the scope of this course**.

   The set of notes is meant to demonstrate the writer's ability in comprehending such a piece of mathematics and his/her command in the language of mathematics.

   The text of the submitted work must be typed. (Handwritten work will not be accepted.)

2. **Grading.**

   (a) The **grading** for the *Special Exercise* will be attuned to distinguish whether a student may be deemed to have acquired well integrated knowledge and a deep understanding of every aspect of the course, and whether the student concerned may be deemed to be able to completely solve unfamiliar and nonstandard problems, and to provide innovative approaches to challenging ones.

   (b) If you decide to NOT attempt the *Special Exercise* (and hence not submit any set of notes), you will be automatically awarded 3 marks (out of the full-score of 10 marks).

   (c) If you submit a mediocre or lowly rated work, you could end up with a score less than 3.

3. **Instructions.**

   (a) You are required to submit your set of notes to 'Veriguide', and an identical copy of it to the 'blackboard' item 'Special Exercise', **no later than 2359hrs 9th May 2021**.

   (b) You are allowed a maximum of three submissions to the 'Blackboard' prior to the submission deadline.
   Only the last submission prior to the submission deadline will be graded.

   (c) There is a penalty on late 'first submission': if you are submitting your work on the N-th day after the submission deadline, your grade for this component will be subjected to a deduction of N subgrades.

   (d) **You must follow the instructions set out in the 'Instructions on submission of work'.** See Section B ('Typed work') and Section C ('Electronic submissions') for detail.

4. **You may be required to attend an interview for ascertaining that you are indeed the author of the submitted work.**

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Frequently asked questions.
Below is a list of frequently asked questions for such an exercise. For their answers, refer to the Appendix.

1. What is an ideal submitted work (that might receive a 'high grade')?
2. How to interpret the word limits?
3. Will I be disadvantaged by my (not very good) English?
4. Are there any tips on what content to write?
5. How is the university guideline on academic honesty interpreted in this exercise?
6. Do I have to state every definition/theorem in full that I think related to the theme?
7. May I include pictures/diagrams in my work? Do I have to type them? How do they count in terms of 'word limits'?
8. Am I obliged to use LaTeX?

Appendix. Frequently asked questions.

1. **What is an ideal submitted work (that might receive a 'high grade')?**

   (a) An ideal submitted work is a piece of mathematical knowledge, with correct and well-organized content, digested by you after reading the prescribed text, and therefore belonging to you. It demonstrates what you have learnt on the topic you have chosen.

   (b) You are free to decide whether you aim at a greater breadth or a greater depth on the various ideas you touch upon in the prescribed text.

   You are free to make your own judgement on what to say and what not to say, and on what to say more, what to say less.

   But you certainly are not going to copy an entire set of the prescribed text (as you have to work within word limits).

   (c) Remember: A coherent and well-organized set of notes is rated more highly than a confusing set, no matter how much material the latter contains.

2. **How to interpret the word limits?**

   (a) The exercise is not a competition on who writes more words. The length of your set of notes has no direct relation with how good your set of notes is deemed.

   (b) The upper bound is meant to be reminder on when you should stop on any specific idea in your chosen topic.

   (You can't just copy down everything from the prescribed text.)

   (c) The lower bound is meant to reminder on whether you have written too little overall.

   (d) Be aware that every word you write will count towards the word limit.

   (e) Each equality/inequality counts as one word.

3. **Will I be disadvantaged by my (not very good) English?**

   (a) This exercise is not intended for testing your proficiency in the English language.

   (b) Serious grammatical mistakes and spelling mistakes might be penalized, but only when they matter in the mathematical content of the notes.

   (c) You are encouraged to try (as best you can) to write complete sentences, for the purpose of making the mathematical content clear.

4. **Are there any tips on what content to write?**

   (a) You may quote anything (definitions, results, examples) from the prescribed text and from course material (Handouts, Exercises et cetera) available at the course homepage.

   (b) You may provide, in your set of notes, proofs of results (or outline of proofs) that are not provided in the prescribed text.

   (c) You may also incorporate your own work, such as your solution to specific problems in the exercises in the prescribed text, into your set of notes.

5. **How is the university guideline on academic honesty interpreted in this exercise?**

   (a) Original investigative work is NOT expected.

   (b) As long as you are quoting from course material, you are not required to 'cite the source'.

   (c) If you are quoting from material from the prescribed text, you should indicate the page number.

   (d) If you are citing something from an 'outside source' (for instance, a book), you have to indicate the source (for instance, the title of the book and the relevant page of the book).

(e) You are not expected to compile any bibliography.

(f) Beyond the above, you are reminded to abide by the standard rules and practices on academic honesty. As stated in the 'description of the task', the work submitted is supposed to be a set of notes compiled by yourself.

You may be required to attend an interview for ascertaining that you are indeed the author of the submitted work.

6. **Do I have to state every definition/theorem in full that I think related to the theme?**

   (a) You have to make your own judgement on which definition/theorem to be stated. This is the point of the exercise. (You will exceed the upper bound of the word limit very quickly without doing anything meaningful if you are just copying every definition/theorem that you think related to the theme.)

   (b) When you are stating a definition/theorem, you must state it correctly, as if you were asked to state it in a written examination. This is also the point of the exercise.

7. **May I include pictures/diagrams in my work? Do I have to type them? How do they count in terms of 'word limits'?**

   You may include pictures/diagrams in your work, provided they are drawn by you and are relevant to the content. (You are not allowed to just do 'copy-and-paste' for pictures/diagrams.)

   You do not have to type them. If these are genuine pictures/diagrams, they don't count in the 'word limits'.

   If such pictures/diagrams are relevant to the content and make your work better, they will count in the grading of your work.

8. **Am I obliged to use LaTeX?**

   You are NOT obliged to work with LaTeX. However, you are encouraged to learn LaTeX, because it is easier to prepare a mathematical text with LaTeX than with WORD.