Using Generative AI Responsibly in Mathematics Assessments: A Checklist for Students and Staff

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1. Introduction

This document provides guidance on how generative AI tools may be used to support assessment tasks within the mathematical sciences. It has been designed to help staff and students understand where AI use can enhance learning, planning, and reflection, while ensuring that all assessed work remains the student's own. The examples provided focus on clear and well-defined uses of AI, such as supporting understanding, planning, writing, reflection, and presentation, rather than generating solutions or performing substantive parts of assessed work. They are designed to help students develop their own judgement and AI literacy, encouraging them to engage critically with AI outputs rather than becoming reliant upon them.

AI can be a valuable aid to understanding and communication within mathematics, but it should never replace independent reasoning, problem-solving, or authorship. The examples in this checklist are designed to show how AI tools can be used responsibly, transparently, and within clear disciplinary boundaries by students.

2. How to Use this Checklist

The checklist has been developed so that it can be shared directly with students. Staff are encouraged to adapt and include relevant sections within their assessment briefs, module handbooks, or online guidance to provide clarity on what forms of generative AI use are permitted for a given assessment task.

Whilst written from the perspective of the mathematical sciences, departments may adapt or extend it to reflect local practices and discipline-specific contexts. Where any AI use of is permitted, expectations should be made clear in assessment briefs, and students should be required to acknowledge and reflect on how AI has been used within their submission. Each statement uses "*You may/You must*" language to ensure clarity from a student perspective. The final column provides notes and conditions to explain the limits of acceptable use.

3. Checklist of Permitted AI Use in Mathematics Assessments

Assessment Stage	AI Use Type/Example	Permitted (Yes/No)	Notes or Conditions
1. Understanding the Assessment Task	You may ask AI to explain assessment instructions or technical terms in plain language to help you understand what is being asked.		Always check your interpretation against official module guidance.
	You may ask AI to restate or rephrase a complex question to make sure you understand it.		You must not use AI to generate or attempt the solution itself.
	You may ask AI to describe general problem-solving methods (for example, how integration by parts works), but you must not ask it to complete an assigned problem for you.		Cross-check explanations with lecture notes or other authoritative sources.
	You may ask AI to provide a simple, unrelated example that illustrates a similar concept (for example, a different first-order differential equation).		Use only for conceptual understanding, not to mirror or solve the assessed problem.
	You may ask AI to list common mistakes students make in similar types of mathematical problems.		Use this to anticipate pitfalls; do not use AI-generated corrections as your own work.
	You may ask AI to clarify what different command words mean (for example, "*evaluate*", "*justify*", "*prove*").		Confirm your understanding using your module materials and lecture notes.
	You may ask AI to explain what kinds of reasoning or evidence are typically expected in this type of question (for example, showing all working or justifying each modelling choice or assumption).		Use this to understand expectations, not as a template for your answer.
2. Planning and Preparation	You may use AI to identify mathematical topics, formulae, or techniques that may be relevant to your assessment.		You must verify relevance independently through your lecture notes or course materials.
	You may use AI to outline the general steps involved in solving a type of problem (for example, eigenvalue calculation), but you must not ask it to solve a specific assessed question.		You must be able to explain each step and reasoning in your own words.
	You may ask AI to outline a possible structure for your mathematical report, such as suggesting which sections to include and in what order (for example, Introduction, Model Design, Results, Discussion).		You must write all sections and explanations independently.
	You may use AI to generate potential research questions, project ideas, or hypotheses.		You must refine and approve your final choice independently.
	You may ask AI to create revision questions or short quizzes to practise relevant techniques.		Do not reuse these questions or answers in your assessment.

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	You may use AI to identify possible variables, parameters, or assumptions to consider in a mathematical model.		You must decide which to include and justify your reasoning.
	You may use AI to draft a simple timeline or task plan for completing your assessment.		You remain responsible for meeting all deadlines and milestones.
	You may ask AI to compare alternative mathematical methods for solving a type of problem (for example, substitution vs integration by parts) and explain the advantages or limitations of each.		You must decide which method is most appropriate and justify your choice.
3. Research and Analysis	You may use AI to check your understanding of statistical or numerical techniques (for example, regression, interpolation, or numerical integration), but you must not use it to compute final answers for assessed tasks.		You must show your own working and be able to explain every step.
	You may ask AI to summarise the main ideas of a theorem, paper, or definition to aid your understanding.		Verify all summaries against the original source.
	You may use AI to suggest relevant textbooks, articles, or online resources on a topic.		You must confirm that all sources are legitimate and relevant.
	You may use AI to explain how to interpret outputs from mathematical or statistical software (for example, regression plots or error bars).		Check your understanding with reliable sources or staff feedback.
	You may use AI to suggest example code for visualising data or functions, but you must write, adapt, and explain the final version yourself.		You remain responsible for correctness and accuracy of results.
	You may use AI to demonstrate the steps of an algorithm or symbolic manipulation in pure mathematics (for example, matrix diagonalisation or algebraic factorisation) for learning purposes, but you must not copy these into assessed work.		For conceptual understanding only.
	You may use AI to generate mock data sets to test your computational methods.		Test data must not be used for final analysis or submission.
	You may use AI to identify potential sources of error, bias, or uncertainty in data or models you are developing.		You must verify and discuss these in your own analysis.
4. Drafting and Composition	You may use AI to suggest how to format or improve the layout of your mathematical report (for example, consistent headings, notation styles, or figure placement).		You must write and develop all content independently.

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	You may ask AI to suggest transition phrases to improve the logical flow of a proof or explanation (for example, "*therefore*", "*it follows that*", "*by substitution*").		Ensure transitions accurately reflect your reasoning and results.
	You may use AI to help format references or generate citations.		You must verify all references and ensure they correspond to genuine sources.
	You may use AI to check grammar, notation consistency, and LaTeX formatting.		You must ensure mathematical symbols and content remain correct.
	You may ask AI to rephrase explanatory text to improve clarity, but you must ensure your mathematical reasoning and conclusions remain unchanged.		Always proof-read final text for accuracy.
	You may ask AI to comment on whether your mathematical explanations, definitions, and reasoning are clear, precise, and logically structured.		Review feedback critically; not all suggestions will be appropriate.
	You may use AI to suggest suitable ways to visualise mathematical results (for example, using contour plots to represent solutions or residuals).		You must check that figures are accurate and appropriately labelled.
	You may use AI to create schematic diagrams or flowcharts showing relationships between equations, variables, or stages of a method.		You must verify that all labels and relationships are correct.
	You may ask AI to suggest ways to communicate a mathematical idea or result to a non-specialist audience (for example, describing a proof concept in plain language).		You must ensure your explanation remains mathematically accurate but the explanation should be your own.
5. Revision and Reflection	You may use AI to identify parts of your reasoning or proofs that are unclear or would benefit from fuller explanation.		Review all AI feedback critically and decide what to change.
	You may ask AI to challenge your reasoning or question your assumptions and conclusions (for example, "*What would happen if this parameter were doubled?*").		Use these for self-assessment; do not submit AI-generated reasoning.
	You may ask AI to check for potential logical inconsistencies, sign errors, or computational 'slips' in your working.		You must verify any suggested corrections manually.
	You may ask AI to generate reflective prompts about your mathematical process (for example, "*Which step in the proof was least intuitive?*").		You must compose your reflection independently.

Assessment Stage	AI Use Type/Example	Permitted (Yes/No)	Notes or Conditions
	You may use AI to draft or plan your reflective commentary on how you approached the assessment.		You must write and take ownership of the final reflection.
	You may ask AI to suggest ways to improve how you present step-by-step reasoning or justification in proofs and derivations.		You decide which suggestions to adopt.
	You may use AI to generate practice prompts to rehearse explaining your reasoning aloud.		Use only for practice; do not include AI-generated material in assessed work.
6. Presentation and Submission	In written reports: You may use AI to proofread your final report for grammar or formatting, but you must check that equations, notation, and symbols remain correct.		Always check for unintended changes to symbols or meaning.
	You may use AI to design the layout or visual appearance of slides, posters, or written reports.		You must prepare and verify all content independently.
	You may ask AI to suggest titles, slide headings, or concise bullet points for presentations.		You must present and explain material in your own words.
	In presentations or posters: You may use AI to check spelling or grammar in slide text or captions, but you must verify that mathematical notation remains correct.		Review all edits for accuracy.
	You may use AI to create accessible text alternatives for figures (for example, image descriptions).		Ensure that all descriptions are accurate and match your content.
	You may use AI to generate practice questions to rehearse for oral assessments or vivas.		You must respond to all assessment questions independently.
	You may use AI to simplify or translate small sections of explanatory text (for example, your abstract) into clearer English.		Ensure that mathematical meaning and notation are preserved.
	You may use AI to help you write a short statement acknowledging and describing how you used AI responsibly in your work.		You must ensure the statement accurately reflects your own use and is included in your submission.

4. Notes on Use in Mathematics Contexts

Generative AI tools should not be used by students to produce or solve assessed mathematical problems, proofs, or derivations. Students remain responsible for ensuring that all submitted work is accurate, clearly presented, and genuinely their own. AI is most helpful when it supports understanding, communication, or presentation, rather than completing the mathematical work itself. In project-based modules, the extent to which AI can be used will depend on whether the tools form part of what is being critically examined,

for example when software that performs symbolic algebra, generate sample data, or assist with statistical analysis form part of the methodology under review.

Staff may wish to adapt this checklist for different assessment formats. For problem-solving tasks, students can use AI to explore ideas but not to generate complete answers. In mathematical reports or modelling projects, AI can assist with planning, writing, and reflection. In computational work, it may help explain or debug code, but should not generate full solutions. For oral assessments, students can use AI to rehearse or generate practice questions, but all responses and presentations must be their own.

Overall, this checklist is intended to help staff and students make thoughtful, transparent, and ethical use of AI in mathematical assessment. Its purpose is to uphold academic integrity, support the development of professional judgement, and promote the responsible integration of AI as an evolving tool within mathematical learning and practice.