

DEPARTMENT OF MATHEMATICS
Writing and Speaking Outcomes

Students should demonstrate the ability to:

1. read, understand, and make informed judgments about mathematical arguments.

- to show that they can analyze and critique mathematical arguments. Students should be able to make a sound case as to the correctness of the argument, explaining any problems that are found and suggesting ways to remedy the problems
- to show that they can understand and critique both mathematical papers and technical papers that rely on mathematical techniques

2. generate clearly reasoned, convincing proofs.

- to show that they can move successfully from discovery of a proof to the writing of a proof. Students must demonstrate that they possess both the creativity that guides discovery and the careful deductive reasoning that structures an argument of proof
- to show that they can construct a proof in such a way that the reader can follow the steps logically from one to another and is convinced of the validity of the proof
- to show that they possess a sound conceptual understanding of mathematics as revealed in the construction of proofs

3. apply mathematics and mathematical reasoning to solving real-world problems.

- to show that they can use mathematics to solve problems in situations in which the assumptions are not clear. They should be able to exhibit the ability to use mathematical modeling and/or use mathematics in the experimental process
- to show that they can present mathematical arguments in a problem-solution format, both in writing and in speaking, for audiences of non-mathematicians who need to act on the solution to the problem
- to show that they can analyze a problem, precisely define the key terms, and draw clear and reasonable conclusions

4. explain mathematics intelligibly to a variety of audiences.

- to show that they can present mathematics to various audiences, such as students of mathematics, mathematicians, and non-mathematicians who need to understand it and/or use it. Students must be able to put mathematical language into everyday language: to write essays, journalistic pieces, reports, summaries, etc. and give oral presentations about mathematical topics
- to show that they can explain mathematics in more than one mode of representation for audiences who may need alternative modes to enhance their understanding.