

Learning Outcomes for Mathematics

When students write proofs, they need to:

0) Utilize Appropriate Mathematical Symbols

- Move from describing a pattern in a "general" way to describing it using mathematical terminology, unambiguously.
- Understand the definition of mathematical symbols.
- Use mathematical symbols to express ideas.

1) Proof Writing (for other mathematicians)

- Identify what information is given/assumed in a problem statement.
- Identify what needs to be proved in a problem statement.
- Brainstorm possible approaches for solving the problem.
- Identifying when a particular technique leads to a difficulty.
- Identify relevant rules for the particular problem.

2) Determining Possible Applications of Results

- Understanding the limitations of assumptions made.
- Understanding how models of reality can be created from mathematical ideas.
- Understanding the limitations of conclusions that can be drawn from mathematics.

3) Communicating Results to non-mathematicians

- Extract qualitative conclusions from mathematical results.
- Explain the problem posed/solved without mathematical technicalities.
- Explain the limits of those conclusions.