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The role of logic in teaching proof.

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Summary: Even simple mathematical proofs and disproofs are more logically complex than most mathematicians realize. Research by mathematics educators and cognitive psychologists supports the claim that the logical reasoning abilities needed to discover them are not widely present in the population. Two hypotheses are proposed to explain some of the reasons why so many students have difficulty with proof and disproof: differences between mathematical language and the language of everyday discourse, and the kinds of shortcuts and simplifications that have been part of students' previous mathematical instruction. The article describes research about whether instruction can help students develop formal reasoning skills and suggests that such instruction can be successful when done with appropriate parallel development of transfer skills. The final sections discuss at what point the principles of logic should be introduced and give a variety of suggestions about how to teach them.

Classification: E30 E50

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