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Nota di contenuto	1. Aspects of proof in mathematics education: Gila Hanna and Michael de Villiers -- Part I: Proof and cognition -- 2. Cognitive development of proof: David Tall, Oleksiy Yevdokimov, Boris Koichu, Walter Whiteley, Margo Kondratieva, and Ying-Hao Cheng -- 3. Theorems as constructive visions: Giuseppe Longo -- Part II: Experimentation: Challenges and opportunities -- 4. Exploratory experimentation: Digitally-assisted discovery and proof: Jonathan M. Borwein -- 5. Experimental approaches to theoretical thinking: Artefacts and proofs -- Ferdinando Arzarello, Maria Giuseppina Bartolini Bussi, Allen Leung, Maria Alessandra Mariotti, and Ian Stevenson (With response by J. Borwein and J. Osborn) -- Part III: Historical and educational perspectives of proof -- 6. Why proof? A historian's perspective: Judith V. Grabiner -- 7. Conceptions of proof – in research and in teaching: Richard Cabassut, AnnaMarie Conner, Filyet Asli Ersoz, Fulvia Furinghetti, Hans Niels Jahnke, and Francesca Morselli -- 8. Forms of proof and proving in the classroom: Tommy Dreyfus, Elena Nardi, and

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## Sommario/riassunto

One of the most significant tasks facing mathematics educators is to understand the role of mathematical reasoning and proving in mathematics teaching, so that its presence in instruction can be enhanced. This challenge has been given even greater importance by the assignment to proof of a more prominent place in the mathematics curriculum at all levels. Along with this renewed emphasis, there has been an upsurge in research on the teaching and learning of proof at all grade levels, leading to a re-examination of the role of proof in the curriculum and of its relation to other forms of explanation, illustration and justification. This book, resulting from the 19th ICMI Study, brings together a variety of viewpoints on issues such as: The potential role of reasoning and proof in deepening mathematical understanding in the classroom as it does in mathematical practice. The developmental nature of mathematical reasoning and proof in teaching and learning from the earliest grades. The development of suitable curriculum materials and teacher education programs to support the teaching of proof and proving. The book considers proof and proving as complex but foundational in mathematics. Through the systematic examination of recent research this volume offers new ideas aimed at enhancing the place of proof and proving in our classrooms.

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