

CONTENTS

Preface

The ongoing value of proof <i>Gila Hanna</i>	3
---	---

Introduction

Theorems in school: An introduction <i>Paolo Boero</i>	19
---	----

Part I: The historical and epistemological dimension

1	Origin of mathematical proof: History and epistemology <i>Gilbert Arsac</i>	27
2	The proof in the 20th century: From Hilbert to automatic theorem proving <i>Ferdinando Arzarello</i>	43
3	Students' proof schemes revisited <i>Guershon Harel</i>	65

Part II: Curricular choices, historical traditions and learning of proof: Two national case studies

4	Curriculum change and geometrical reasoning <i>Celia Hoyles and Lulu Healy</i>	81
5	The tradition and role of proof in mathematics education in Hungary <i>Julianna Szendrei-Radnai and Judit Török</i>	117

Part III: Argumentation and proof

6	Cognitive functioning and the understanding of mathematical processes of proof <i>Raymond Duval</i>	137
7	Some remarks about argumentation and proof <i>Nadia Douek</i>	163

Part IV: Didactical aspects

8	Making possible the discussion of “impossible in mathematics” <i>Greisy Winicki-Landman</i>	185
9	The development of proof making by students <i>Carolyn A. Maher, Ethel M. Muter and Regina D. Kiczek</i>	197
10	Approaching and developing the culture of geometry theorems in school: A theoretical framework <i>Marolina Bartolini Bussi, Paolo Boero, Franca Ferri, Rossella Garuti and Maria Alessandra Mariotti</i>	211
11	Construction problems in primary school: A case from the geometry of circle <i>Maria G. Bartolini Bussi, Mara Boni and Franca Ferri</i>	219
12	Approaching theorems in grade VIII: Some mental processes underlying producing and proving conjectures, and conditions suitable to enhance them <i>Paolo Boero, Rossella Garuti and Enrica Lemut</i>	249
13	From dynamic exploration to “theory” and “theorems” (from 6th to 8th grades) <i>Laura Parenti, Maria Teresa Barberis, Massima Pastorino and Paola Viglienzone</i>	265
14	Geometrical proof: The mediation of a microworld <i>Maria Alessandra Mariotti</i>	285
15	The transition to formal proof in geometry <i>Ferdinando Arzarello, Federica Olivero, Domingo Paola and Ornella Robutti</i>	305