Contents

Part I Current State of Students’ Inadequacies, Conceptions and Fluency of Algebra in the US Colleges

1 Algebra Underperformances at College Level: What Are the Consequences? Sepideh Stewart and Stacy Reeder 3

2 Examining the Role of Prior Experience in the Learning of Algebra Mercedes McGowen 19

Part II College Algebra in a Broader Context

3 Long-Term Effects of Sense Making and Anxiety in Algebra David Tall 43

4 Misconceptions and Learning Algebra Julie L. Booth, Kelly M. McGinn, Christina Barbieri, and Laura K. Young 63

5 A Deep Understanding of Fractions Supports Student Success in Algebra Stacy Reeder 79

Part III Positive Approaches to the Teaching of Algebra

6 Overcoming the Algebra Barrier: Being Particular About the General, and Generally Looking Beyond the Particular, in Homage to Mary Boole John Mason 97

7 Algebra as Part of an Integrated High School Curriculum James T. Fey and David A. Smith 119
8  Teaching and Learning Middle School Algebra: Valuable Lessons from the History of Mathematics 131
Mala S. Nataraj and Mike Thomas

Part IV  Proposed Future Developments
9  Cognitive Neuroscience and Algebra: Challenging Some Traditional Beliefs 157
Carolyn Kieran

10  Rethinking Algebra: A Versatile Approach Integrating Digital Technology 173
Mike Thomas

Part V  Teaching Higher Algebra
11  Why Does Linear Algebra Have to Be So Abstract? 205
John Hannah

12  School Algebra to Linear Algebra: Advancing Through the Worlds of Mathematical Thinking 219
Sepideh Stewart

Index 235
And the Rest is Just Algebra
Stewart, S. (Ed.)
2017, XX, 238 p. 92 illus., 22 illus. in color., Hardcover
ISBN: 978-3-319-45052-0