

Contents

Preface	vii
Introduction	1
1 The Conference: Rethinking the Preparation for Calculus, <i>Jack Narayan and Darren Narayan</i>	3
2 Twenty Questions about Precalculus, <i>Lynn Arthur Steen</i>	8
Background	13
3 Who are the Students Who Take Precalculus?, <i>Mercedes A. McGowen</i>	15
4 Enrollment Flow to and from Courses Below Calculus, <i>Steven R. Dunbar</i>	28
5 What Have We Learned from Calculus Reform? The Road to Conceptual Understanding, <i>Deborah Hughes Hallett</i>	43
6 Calculus and Introductory College Mathematics: Current Trends and Future Directions, <i>Susan L. Ganter</i>	46
Theme 1. New Visions for Introductory Collegiate Mathematics	55
7 Refocusing Precalculus: Challenges and Questions, <i>Nancy Baxter Hastings</i>	57
8 Preparing Students for Calculus in the Twenty-First Century, <i>Sheldon P. Gordon</i>	64
9 Preparing for Calculus and Preparing for Life, <i>Bernard L. Madison</i>	78
10 College Algebra: A Course in Crisis, <i>Don Small</i>	83
11 Changes in College Algebra, <i>Scott R. Herriott</i>	90
12 One Approach to Quantitative Literacy: Understanding our Quantitative World, <i>Janet Andersen</i>	101
Theme 2. The Transition from High School to College	109
13 High School Overview and the Transition to College, <i>Zalman Usiskin</i>	111

14	Precalculus Reform: A High School Perspective, <i>Daniel J. Teague</i>	121
15	The Influence of Current Efforts to Improve School Mathematics on the Preparation for Calculus, <i>Eric Robinson and John Maceli</i>	129
Theme 3. The Needs of Other Disciplines		151
16	Fundamental Mathematics: Voices of the Partner Disciplines, <i>William Barker and Susan L. Ganter</i>	153
17	Skills versus Concepts at West Point, <i>Rich West</i>	160
18	Integrating Data Analysis into Precalculus Courses, <i>Allan J. Rossman</i>	169
Theme 4. Student Learning and Research		179
19	Assessing What Students Learn: Reform versus Traditional Precalculus and Follow-up Calculus, <i>Florence S. Gordon</i>	181
20	Student Voices and the Transition from Reform High School Mathematics to College Mathematics, <i>Rebecca Walker</i>	193
Theme 5. Implementation		211
21	Some Political and Practical Issues in Implementing Reform, <i>Robert E. Megginson</i>	213
22	Implementing Curricular Change in Precalculus: A Dean's Perspective, <i>Judy E. Ackerman</i>	219
23	The Need to Rethink Placement in Mathematics, <i>Sheldon P. Gordon</i>	224
24	Changing Technology Implies Changing Pedagogy, <i>Lawrence C. Moore and David A. Smith</i>	229
25	Preparing for Calculus and Beyond: Some Curriculum Design Issues, <i>Al Cuoco</i>	235
26	Alternatives to the One-Size-Fits-All Precalculus/College Algebra Course, <i>Bonnie Gold</i>	249
Theme 6. Influencing the Mathematics Community		255
27	Launching a Precalculus Reform Movement: Influencing the Mathematics Community, <i>Bernard L. Madison</i>	257
28	Mathematics Programs for the Rest-of-Us, <i>Naomi D. Fisher and Bonnie Saunders</i>	265
29	Where Do We Go From Here? Creating a National Initiative to Refocus the Courses below Calculus, <i>Sheldon P. Gordon</i>	274
Ideas and Projects that Work: Part 1		283
30	College Precalculus Can Be a Barrier to Calculus: Integration of Precalculus with Calculus Can Achieve Success, <i>Doris Schattschneider</i>	285

31 College Algebra Reform through Interdisciplinary Applications,
William P. Fox 295

32 Elementary Math Models: College Algebra Topics and a Liberal Arts Approach,
Dan Kalman 304

33 The Case for Labs in Precalculus,
Brigitte Lahme, Jerry Morris, and Elias Toubassi 310

34 The Fifth Rule: Direct Experience of Mathematics,
Gary Simundza 320

Ideas and Projects that Work: Part 2 **329**

35 Mathematics in Action: Empowering Students with Introductory and Intermediate College
Mathematics, *Ernie Danforth, Brian Gray, Arlene Kleinstein, Rick Patrick, and Sylvia Svitak* .. 333

36 Precalculus: Concepts in Context,
Marsha Davis 337

37 Rethinking College Algebra,
Benny Evans 341

38 From The Bottom Up,
Sol Garfunkel 345

39 The Functioning in the Real World Project,
Florence S. Gordon and Sheldon P. Gordon 348

40 The Importance of a Story Line: Functions as Models of Change,
Deborah Hughes Hallett 352

41 Using a Guided-Inquiry Approach to Enhance Student Learning in Precalculus,
Nancy Baxter Hastings 355

42 Maricopa Mathematics,
Alan Jacobs 360

43 College Algebra/Quantitative Reasoning at the University of Massachusetts, Boston,
Linda Almgren Kime 364

44 Developmental Algebra: The First Mathematics Course for Many College Students,
Mercedes A. McGowen 369

45 Workshop Precalculus: Functions, Data, and Models,
Allan J. Rossman 376

46 Contemporary College Algebra,
Don Small 380

47 Precalculus: A Study of Functions and Their Applications,
Todd Swanson 386

48 Success and Failures of a Precalculus Reform Project,
David M. Wells and Lynn Tilson 390

49 The Earth Math Projects,
Nancy Zumoff and Christopher Schaufele 393