

Contents

| | |
|--------------|---|
| Preface..... | v |
|--------------|---|

Part 1: Perspectives

| | |
|--|----|
| 1. The van Hiele Model of the Development of Geometric Thought..... | 1 |
| <i>Mary L. Crowley, Dalhousie University, Halifax, Nova Scotia</i> | |
| 2. Resolving the Continuing Dilemmas in School Geometry..... | 17 |
| <i>Zalman Usiskin, University of Chicago, Chicago, Illinois</i> | |
| 3. Implications of Computer Graphics Applications for Teaching Geometry..... | 32 |
| <i>James R. Smart, San Jose State University, San Jose, California</i> | |
| 4. Can Geometry Survive in the Secondary Curriculum?..... | 37 |
| <i>Ivan Niven, University of Oregon, Eugene, Oregon</i> | |
| 5. Euclid May Stay—and Even Be Taught..... | 47 |
| <i>Tommy Dreyfus, Weizmann Institute of Science, Rehovot, Israel</i> <i>Nurit Hadas, Weizmann Institute of Science, Rehovot, Israel</i> | |

Part 2: A View of Problem Solving and Applications

| | |
|--|-----|
| 6. Geometry: An Avenue for Teaching Problem Solving in Grades K–9..... | 59 |
| <i>Linda J. DeGuire, University of North Carolina at Greensboro, Greensboro, North Carolina</i> | |
| 7. Creative Geometry Problems Can Lead to Creative Problem Solvers..... | 69 |
| <i>George A. Milauskas, Barrington High School, Barrington, Illinois</i> | |
| 8. Logo Adds a New Dimension to Geometry Programs at the Secondary Level..... | 85 |
| <i>Margaret J. Kenney, Boston College, Chestnut Hill, Massachusetts</i> | |
| 9. Some Modern Uses of Geometry..... | 101 |
| <i>Donald W. Crowe, University of Wisconsin—Madison, Madison, Wisconsin</i> <i>Thomas M. Thompson, Walla Walla College, College Place, Washington</i> | |

Part 3: Activities in Focus

10. Geometry—a Square Deal for Elementary School 113
Marcia E. Dana, Glendale Elementary School, Madison, Wisconsin
11. Spatial Perception and Primary Geometry 126
John J. Del Grande, New Market, Ontario
12. Similarity: Investigations at the Middle Grade Level 136
Alex Friedlander, Weizmann Institute of Science, Rehovot, Israel
Glenda Lappan, Michigan State University, East Lansing, Michigan
13. Visualizing Three Dimensions by Constructing Polyhedra 144
Victoria Pohl, University of Southern Indiana, Evansville, Indiana
14. Conic Sections: An Exciting Enrichment Topic 155
Roselyn Teukolsky, Ithaca High School, Ithaca, New York

Part 4: A Look at Geometry and Other Mathematics

15. Probability in High School Geometry 175
Ernest Woodward, Austin Peay State University, Clarksville, Tennessee
Larry Hoehn, Austin Peay State University, Clarksville, Tennessee
16. Mathematical Applications of Geometry 184
Vincent P. Schielack, Jr., Texas A & M University, College Station, Texas
17. Geometry for Calculus Readiness 195
Richard H. Balomenos, University of New Hampshire, Durham, New Hampshire
Joan Ferrini-Mundy, University of New Hampshire, Durham, New Hampshire
Thomas Dick, University of New Hampshire, Durham, New Hampshire
18. Geometric Counting Problems 210
Bonnie H. Litwiller, University of Northern Iowa, Cedar Falls, Iowa
David R. Duncan, University of Northern Iowa, Cedar Falls, Iowa

Part 5: Preparing Teachers

19. Activities with Teachers Based on Cognitive Research 222
Rina Hershkowitz, Weizmann Institute of Science, Rehovot, Israel
Maxim Bruckheimer, Weizmann Institute of Science, Rehovot, Israel
Shlomo Vinner, Hebrew University, Jerusalem, Israel
20. Geometry for Secondary School Teachers 236
Margaret A. Farrell, State University of New York at Albany, Albany, New York