

Contents

I. Introduction to this Companion Guide

A Note to Instructors	3
Special Features	
<i>In the Text</i>	5
Topics to Explore, Essay Assignments, Problems, Computer Problems, Suggested Readings	
<i>In the Companion Guide</i>	6
Expository Research Papers, Topics for Classroom Discussion, Projects, Tutorials	

II. Chapter Guidelines

1. The Mathematical Landscape	11
2. Varieties of Mathematical Experience	12
3. Outer Issues	32
4. Inner Issues	37
5. Selected Topics in Mathematics	54
6. Teaching and Learning	59
7. From Certainty to Fallibility	64
8. Mathematical Reality	67

III. Sample Syllabus

First Day Handout	75
Syllabus	76

Contents

IV. Sample Group Activities

The Mathematical Experience	89
The Mathematical Landscape	90
Varieties of Mathematical Experience	91
Outer Issues: Utility	92
Inner Issues	93
The Pythagorean Theorem	94
Pythagorean Triples	95
Pascal's Triangle	96
Connections: The Golden Ratio and Fibonacci Numbers	97
From Certainty to Fallibility	98
Mathematical Reality	99

V. Sample Examinations

Sample Take-Home Examination	103
Sample Examination	105
Sample Midterm Examination	107
Sample Final Examination	108

VI. Topics for Expository Research Papers

Topics for Expository Research Papers	113
Suggestions for Grading Essays and Research Papers	119