## Contents

Preface ..... xiUseful Supplements, xiiAcknowledgments for the First Edition, xiiAcknowledgments for This Edition, xiii
How to Use Self Study Edition ..... xiv
Chapter 1
Surfaces and Straightness ..... 1Problem 1.1. When Do You Call a Line Straight?, 1How Do You Construct a Straight Line?, 2Local (and Infinitesimal) Straightness, 4
Problem 1.2. Intrinsic Straight Lines on Cylinders, 6
Problem 1.3. Geodesics on Cones, 8
Is "Shortest" Always "Straight"?, 11
Locally Isometric Surfaces, 12
Local Coordinates for Cylinders and Cones, 13
Problem 1.4. Geodesics in Local Coordinates, 15
Problem 1.5. What Is Straight on a Sphere?, 16
Intrinsic Curvature on a Sphere, 17
Local Coordinates on a Sphere, 18
Problem 1.6. Strakes, Augers, and Helicoids, 18
Problem 1.7. Surfaces of Revolution, 20
Problem 1.8. Hyperbolic Plane, 21
Problem 1.9. Surface as Graph of a Function $z=f(x, y), 23$
Chapter 2
Extrinsic Curves ..... 25
Introduction, 25
Problem 2.1. Give Examples of F.O.V.’s, 26
Archimedian Property, 26

