

# Table of Contents

## Chapter 1 Geometry: Making a Start

- 1.1 Introduction
- 1.2 Euclid's Elements
- 1.3 Geometer's Sketchpad
- 1.4 Getting Started
- 1.5 Similarity and Triangle Special Points
- 1.6 Exercises
- 1.7 Sketchpad and Locus Problems
- 1.8 Custom Tools and Classical Triangle Geometry
- 1.9 Exercises
- 1.10 Sketchpad and Coordinate Geometry
- 1.11 An Investigation via Sketchpad
- 1.12 False Theorems
- 1.13 Exercises

## Chapter 2 Euclidean Parallel Postulate

- 2.1 Introduction
- 2.2 Sum of Angles
- 2.3 Similarity and the Pythagorean Theorem
- 2.4 Inscribed Angle Theorem
- 2.5 Exercises
- 2.6 Results Revisited
- 2.7 The Nine Point Circle
- 2.8 Exercises
- 2.9 The Power of a Point and Synthesizing Apollonius
- 2.10 Tilings of the Euclidean Plane
- 2.11 Exercises

2.12 One Final Exercise

## **Chapter 3 Non-Euclidean Geometries**

3.1 Abstract and Line Geometries

3.2 Poincaré Disk

3.3 Exercises

3.4 Classifying Theorems

3.5 Orthogonal Circles

3.6 Exercises

## **Chapter 4 Transformations**

4.1 Transformations and Isometries

4.2 Compositions

4.3 Exercises

4.4 Tilings Revisited

4.5 Dilations

4.6 Exercises

4.7 Using Transformations in Proofs

4.8 Stereographic Projection

4.9 Exercises

## **Chapter 5 Inversion**

5.1 Dynamic Investigation

5.2 Properties of Inversion

5.3 Exercises

5.4 Applications of Inversion

5.5 Tilings of the Hyperbolic Plane

5.6 Exercises

