

Geometry

By Elayn Martin-Gay

Chapter 1: The Beginning of Geometry

- 1.1 Tips for Success in Mathematics
- 1.2 Geometry—A Mathematical System
- 1.3 Points, Lines, and Planes
- 1.4 Segments and Their Measure
- 1.5 Angles and Their Measure
- 1.6 Angle Pairs and Their Relationships
- 1.7 Coordinate Geometry—Midpoint and Distance Formulas
- 1.8 Constructions—Basic Geometry Constructions

Chapter 2: Introduction to Reasoning and Proofs

- 2.1 Perimeter, Circumference, and Area
- 2.2 Patterns and Inductive Reasoning
- 2.3 Conditional Statements
- 2.4 Biconditional Statements and Definitions
- 2.5 Deductive Reasoning
- 2.6 Reviewing Properties of Equality and Writing Two-Column Proofs
- 2.7 Proving Theorems About Angles

Chapter 3: Parallel and Perpendicular Lines

- 3.1 Lines and Angles
- 3.2 Proving Lines are Parallel
- 3.3 Parallel Lines and Angles Formed by Transversals
- 3.4 Proving Theorems About Parallel and Perpendicular Lines
- 3.5 Constructions—Parallel and Perpendicular Lines
- 3.6 Coordinate Geometry—The Slope of a Line
- 3.7 Coordinate Geometry—Equations of Lines

Chapter 4: Triangles and Congruence

- 4.1 Types of Triangles
- 4.2 Congruent Figures
- 4.3 Congruent Triangles by SSS and SAS
- 4.4 Congruent Triangles by ASA and AAS
- 4.5 Proofs Using Congruent Triangles
- 4.6 Isosceles, Equilateral, and Right Triangles

Chapter 5: Special Properties of Triangles

- 5.1 Perpendicular and Angle Bisectors
- 5.2 Bisectors of a Triangle
- 5.3 Medians and Altitudes of a Triangle
- 5.4 Midsegments of a Triangle
- 5.5 Indirect Proofs and Inequalities in One Triangle

5.6 Inequalities in Two Triangles

Chapter 6: Quadrilaterals

- 6.1 Polygons
- 6.2 Parallelograms
- 6.3 Proving that a Quadrilateral is a Parallelogram
- 6.4 Rhombuses, Rectangles, and Squares
- 6.5 Trapezoids and Kites

Chapter 7: Similarity

- 7.1 Ratios and Proportions
- 7.2 Proportion Properties and Problem Solving
- 7.3 Similar Polygons
- 7.4 Proving Triangles Are Similar
- 7.5 Geometric Mean and Similarity in Right Triangles
- 7.6 Additional Proportions in Triangles

Chapter 8: Transformations

- 8.1 Rigid Transformations
 - 8.2 Translations
 - 8.3 Reflections
 - 8.4 Rotations
 - 8.5 Dilations
 - 8.6 Composition of Reflections
- Extension: Frieze Patterns

Chapter 9: Right Triangles and Trigonometry

- 9.1 The Pythagorean Theorem and Its Converse
 - 9.2 Special Right Triangles
 - 9.3 Trigonometric Ratios
 - 9.4 Solving Right Triangles
 - 9.5 Vectors
- Extension: Law of Sines
- Extension: Law of Cosines

Chapter 10: Area

- 10.1 Angle Measures of Polygons and Regular Polygon Tessellations
- 10.2 Areas of Triangles and Quadrilaterals with a Review of Perimeter
- 10.3 Areas of Regular Polygons
- 10.4 Perimeters and Areas of Similar Figures
- 10.5 Arc Measures, Circumferences, and Arc Lengths of Circles
- 10.6 Areas of Circles and Sectors
- 10.7 Geometric Probability

Chapter 11: Surface Area and Volume

- 11.1 Solids and Cross Sections

- 11.2. Surface Areas of Prisms and Cylinders
- 11.3 Surface Areas of Pyramids and Cones
- 11.4 Volumes of Prisms and Cylinders and Cavalieri's Principle
- 11.5 Volumes of Pyramids and Cones
- 11.6 Surface Areas and Volumes of Spheres
- 11.7 Areas and Volumes of Similar Solids

Chapter 12: Circles and Other Conic Sections

- 12.1 Circle Review and Tangent Lines
 - 12.2 Chords and Arcs
 - 12.3 Inscribed Angles
 - 12.4 Additional Angle Measures and Segment Lengths
 - 12.5 Coordinate Plane—Circles
 - 12.6 Locus
- Extension: Parabolas
- Extension: Ellipses and Hyperbolas