

California: Geometry

Grades Eight Through Twelve — Mathematics Content Standards.

Content Standards	<i>Discovering Geometry</i>
<p>1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning</p>	<p>Chapter 1: Introducing Geometry 1.1: Building Blocks of Geometry</p> <p>Chapter 2: Reasoning in Geometry 2.1: Inductive Reasoning 2.4: Deductive Reasoning 2.5: Angle Relationships 2.6: Special Angles on Parallel Lines Chapter 2 Review</p> <p>Chapter 4: Discovering and Proving Triangle Properties 4.8: Proving Special Triangle Conjectures</p> <p>Chapter 5: Discovering and Proving Polygon Properties 5.7: Proving Quadrilateral Properties</p> <p>Chapter 6: Discovering and Proving Circle Properties 6.4: Proving Circle Conjectures</p> <p>Chapter 13: Geometry as a Mathematical System 13.1: The Premises of Geometry 13.2: Planning a Geometry Proof 13.3: Triangle Proofs 13.4: Quadrilateral Proofs 13.5: Indirect Proof 13.6: Circle Proofs 13.7: Similarity Proofs Chapter 13 Review</p>
<p>2.0 Students write geometric proofs, including proofs by contradiction.</p>	<p>Chapter 2: Reasoning in Geometry 2.5: Angle Relationships 2.6: Special Angles on Parallel Lines</p> <p>Chapter 4: Discovering and Proving Triangle Properties 4.1: Triangle Sum Conjecture 4.3: Triangle Inequalities 4.4: Are There Congruence Shortcuts? 4.5: Are There Other Congruence Shortcuts? 4.6: Corresponding Parts of Congruent Triangles 4.7: Flowchart Thinking 4.8: Proving Special Triangle Conjectures Chapter 4 Review</p> <p>Chapter 5: Discovering and Proving Polygon Properties 5.1: Polygon Sum Conjecture 5.2: Exterior Angles of a Polygon 5.3: Kite and Trapezoid Properties 5.4: Properties of Midsegments</p>

Content Standards**Discovering Geometry**

3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.

5.5: Properties of Parallelograms
5.6: Properties of Special Parallelograms
5.7: Proving Quadrilateral Properties
Chapter 5 Review

Chapter 6: Discovering and Proving Circle Properties

6.2: Chord Properties
6.4: Proving Circle Conjectures
6.5: The Circumference/Diameter Ratio
Chapter 6 Review

Chapter 9: The Pythagorean Theorem

9.1: The Theorem of Pythagoras
9.2: The Converse of the Pythagorean Theorem

Chapter 11: Similarity

11.4: Corresponding Parts of Similar Triangles

Chapter 13: Geometry as a Mathematical System

13.1: The Premises of Geometry
13.2: Planning a Geometry Proof
13.3: Triangle Proofs
13.4: Quadrilateral Proofs
13.5: Indirect Proof
13.6: Circle Proofs
13.7: Similarity Proofs
Chapter 13 Review

Chapter 1: Introducing Geometry

1.3: What's a Widget?
1.5: Triangles
1.8: Space Geometry
Chapter 1 Review

Chapter 2: Reasoning in Geometry

2.3: Mathematical Modeling

Chapter 5: Discovering and Proving Polygon Properties

5.1: Polygon Sum Conjecture

Chapter 10: Volume

Exploration: Sherlock Holmes and Forms of Valid Reasoning

Chapter 11: Similarity

Exploration: Two More Forms of Valid Reasoning
Take Another Look

Chapter 12: Trigonometry

Exploration: Three Types of Proofs

Chapter 13: Geometry as a Mathematical System

Chapter 13 Review

Content Standards

4.0 Students prove basic theorems involving congruence and similarity.

5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.

Discovering Geometry**Chapter 1: Introducing Geometry**

- 1.1: Building Blocks of Geometry
- 1.2: Poolroom Math
- 1.4: Polygons
- 1.5: Triangles
- 1.7: Circles

Chapter 4: Discovering and Proving Triangle Properties

- 4.4: Are There Congruence Shortcuts?
 - 4.5: Are There Other Congruence Shortcuts?
 - 4.6: Corresponding Parts of Congruent Triangles
 - 4.7: Flowchart Thinking
 - 4.8: Proving Special Triangle Conjectures
- Chapter 4 Review

Chapter 5: Discovering and Proving Polygon Properties

- 5.5: Properties of Parallelograms
- 5.6: Properties of Special Parallelograms
- 5.7: Proving Quadrilateral Properties

Chapter 11: Similarity

- 11.1: Similar Polygons
 - 11.2: Similar Triangles
 - 11.4: Corresponding Parts of Similar Triangles
 - 11.7: Proportional Segments Between Parallel Lines
- Take Another Look

Chapter 13: Geometry as a Mathematical System

- 13.1: The Premises of Geometry
 - 13.3: Triangle Proofs
 - 13.4: Quadrilateral Proofs
 - 13.7: Similarity Proofs
- Chapter 13 Review

Chapter 4: Discovering and Proving Triangle Properties

- 4.4: Are There Congruence Shortcuts?
 - 4.5: Are There Other Congruence Shortcuts?
 - 4.6: Corresponding Parts of Congruent Triangles
 - 4.8: Proving Special Triangle Conjectures
- Chapter 4 Review

Chapter 9: The Pythagorean Theorem

Take Another Look

Chapter 11: Similarity

- 11.2: Similar Triangles
 - 11.3: Indirect Measurement with Similar Triangles
 - 11.4: Corresponding Parts of Similar Triangles
 - 11.7: Corresponding Parts of Similar Triangles
- Chapter 11 Review

Chapter 13: Geometry as a Mathematical System

- 13.3: Triangle Proofs
 - 13.7: Similarity Proofs
- Chapter 13 Review

Content Standards	<i>Discovering Geometry</i>
<p>6.0 Students know and are able to use the triangle inequality theorem.</p>	<p>Chapter 4: Discovering and Proving Triangle Properties 4.3: Triangle Inequalities Project: Random Triangles 4.4: Are There Congruence Shortcuts?</p>
<p>7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.</p>	<p>Chapter 2: Reasoning in Geometry 2.6: Special Angles on Parallel Lines</p> <p>Chapter 5: Discovering and Proving Polygon Properties 5.3: Kite and Trapezoid Properties 5.4: Properties of Midsegments 5.5: Properties of Parallelograms 5.6: Properties of Special Parallelograms 5.7: Proving Quadrilateral Properties Chapter 5 Review</p> <p>Chapter 6: Discovering and Proving Circle Properties 6.1: Tangent Properties 6.2: Chord Properties 6.3: Arcs and Angles 6.4: Proving Circle Conjectures 6.5: The Circumference/Diameter Ratio 6.6: Around the World 6.7: Arc Length Exploration: Intersecting Lines Through a Circle Chapter 6 Review Take Another Look</p> <p>Chapter 13: Geometry as a Mathematical System 13.2: Planning a Geometry Proof 13.4: Quadrilateral Proofs 13.5: Indirect Proof 13.6: Circle Proofs Chapter 13 Review</p>
<p>8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.</p>	<p>Chapter 6: Discovering and Proving Circle Properties 6.5: The Circumference/Diameter Ratio 6.6: Around the World</p> <p>Chapter 8: Area 8.1: Areas of Rectangles and Parallelograms 8.2: Areas of Triangles, Trapezoids, and Kites 8.3: Area Problems 8.4: Areas of Regular Polygons Exploration: Pick’s Formula for Area 8.5: Areas of Circles 8.6: Any Way you Slice It 8.7: Surface Area Exploration: Alternative Area Formulas Chapter 8 Review Take Another Look</p>

Content Standards	<i>Discovering Geometry</i>
	<p>Chapter 10: Volume</p> <ul style="list-style-type: none"> 10.1: The Geometry of Solids 10.2: Volume of Prisms and Cylinders 10.3: Volume of Pyramids and Cones 10.4: Volume Problems 10.5: Displacement and Density 10.6: Volume of a Sphere 10.7: Surface Area of a Sphere Chapter 10 Review Take Another Look
<p>9.0 Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.</p>	<p>Chapter 10: Volume</p> <ul style="list-style-type: none"> 10.1: The Geometry of Solids 10.2: Volume of Prisms and Cylinders 10.3: Volume of Pyramids and Cones 10.4: Volume Problems 10.5: Displacement and Density 10.6: Volume of a Sphere Chapter 10 Review
<p>10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.</p>	<p>Chapter 8: Area</p> <ul style="list-style-type: none"> 8.1: Areas of Rectangles and Parallelograms 8.2: Areas of Triangles, Trapezoids, and Kites 8.3: Area Problems 8.4: Areas of Regular Polygons Exploration: Pick’s Formula for Area 8.5: Areas of Circles 8.6: Any Way you Slice It 8.7: Surface Area Exploration: Alternative Area Formulas Chapter 8 Review
<p>11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.</p>	<p>Chapter 10: Volume</p> <ul style="list-style-type: none"> Take Another Look <p>Chapter 11: Similarity</p> <ul style="list-style-type: none"> 11.5: Proportions with Area 11.6: Proportions with Volume Exploration: Why Elephants Have Big Ears 11.7: Proportional Segments Between Parallel Lines Chapter 11 Review
<p>12.0 Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.</p>	<p>Chapter 1: Introducing Geometry</p> <ul style="list-style-type: none"> 1.4: Polygons 1.5: Triangles 1.6: Special Quadrilaterals <p>Chapter 4: Discovering and Proving Triangle Properties</p> <ul style="list-style-type: none"> 4.1: Triangle Sum Conjecture Chapter 4 Review <p>Chapter 5: Discovering and Proving Polygon Properties</p> <ul style="list-style-type: none"> 5.1: Polygon Sum Conjecture 5.2: Exterior Angles of a Polygon Chapter 5 Review

Content Standards
<p>13.0 Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.</p>
<p>14.0 Students prove the Pythagorean theorem.</p>
<p>15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.</p>
<p>16.0 Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.</p>
<p>17.0 Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.</p>

<i>Discovering Geometry</i>
<p>Chapter 4: Discovering and Proving Triangle Properties 4.1: Triangle Sum Conjecture 4.2: Properties of Isosceles Triangles 4.8: Proving Special Triangle Conjectures Chapter 4 Review Take Another Look</p>
<p>Chapter 5: Discovering and Proving Polygon Properties 5.1: Polygon Sum Conjecture 5.2: Exterior Angles of a Polygon Exploration: Star Polygons 5.3: Kite and Trapezoid Properties 5.5: Properties of Parallelograms 5.6: Properties of Special Parallelograms 5.7: Proving Quadrilateral Properties Chapter 5 Review Take Another Look</p>
<p>Chapter 13: Geometry as a Mathematical System 13.4: Quadrilateral Proofs 13.5: Indirect Proof</p>
<p>Chapter 9: The Pythagorean Theorem 9.1: The Theorem of Pythagoras 9.2: The Converse of the Pythagorean Theorem Take Another Look</p>
<p>Chapter 9: The Pythagorean Theorem 9.5: Distance in Coordinate Geometry Chapter 9 Review</p>
<p>Chapter 3: Using Tools of Geometry 3.1: Duplicating Segments and Angles 3.2: Constructing Perpendicular Bisectors 3.3: Constructing Perpendiculars to a Line Project: Constructing a Tile Design 3.4: Constructing Angle Bisectors 3.5: Constructing Parallel Lines 3.6: Construction Problems 3.7: Constructing Points of Concurrency 3.8: The Centroid Chapter 3 Review</p>
<p>Chapter 1: Introducing Geometry Using Your Algebra Skills 1: Midpoint</p>
<p>Chapter 5: Discovering and Proving Polygon Properties Using Your Algebra Skills 5: Writing Linear Equations</p>
<p>Chapter 9: The Pythagorean Theorem 9.5: Distance in Coordinate Geometry</p>
<p>Chapter 13: Geometry as a Mathematical System Using Your Algebra Skills 13: Coordinate Proof</p>

Content Standards

18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.

19.0 Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.

20.0 Students know and are able to use angle and side relationships in problems with special right triangles, such as 30° , 60° , and 90° triangles and 45° , 45° , and 90° triangles.

21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.

22.0 Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.

Discovering Geometry

Chapter 12: Trigonometry

12.1: Trigonometric Ratios
Take Another Look

Chapter 12: Trigonometry

12.2: Problem Solving with Right Triangles
Exploration: Indirect Measurement
12.5: Problem Solving with Trigonometry
Chapter 12 Review

Chapter 9: The Pythagorean Theorem

9.3: Two Special Right Triangles
Take Another Look

Chapter 6: Discovering and Proving Circle Properties

6.1: Tangent Properties
6.2: Chord Properties
6.3: Arcs and Angles
6.4: Proving Circle Conjectures
6.7: Arc Length
Exploration: Intersecting Lines Through a Circle
Chapter 6 Review
Take Another Look

Chapter 13: Geometry as a Mathematical System

13.6: Circle Proofs

Chapter 4: Discovering and Proving Triangle Properties

4.2: Properties of Isosceles Triangles

Chapter 7: Transformations and Tessellations

7.1: Transformations and Symmetry
7.2: Properties of Isometries
7.3: Compositions of Transformations
Chapter 7 Review
Take Another Look