



2012 Curriculum Catalog

Geometry

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Course Overview

Geometry is a full year, high school math course for the student who has successfully completed the prerequisite course, Algebra I. The course focuses on the skills and methods of linear, coordinate, and plane geometry. In it, students will gain solid experience with geometric calculations and coordinate plane graphing, methods of formal proof, and techniques of construction.

By the end of the course, students will be expected to do the following:

- Understand defined terms, axioms, postulates, and theories.
- Apply rules of formal logic and construct proofs in two-column format.
- Know how to solve for angles given parallels, perpendiculars, and transversals.
- Demonstrate how to solve for sides and angles of triangles, quadrilaterals, and polygons.
- Understand trigonometric ratios and know how to use them to solve for unknown sides and angles in given triangles as well as application word problems.
- Be able to determine arcs, chords, and sectors of circles.
- Calculate perimeter, area, and volume of figures and solids.
- Graph lines and determine slopes, midpoints, and distances.
- Make geometric constructions on paper.
- Represent results of motion geometry (translation, rotation, reflection, dilation).

UNIT 1: INTRODUCTION	
Assignment Titles	
1. Course Overview	11. Geometric Postulates
2. Mathematic System: Set Theory Review	12. Review of Algebraic Postulates
3. Mathematic System: Operations with Sets	13. Geometric Theorems
4. Quiz 1: Set Theory	14. Review of Properties of Algebra
5. Geometry Undefined Terms: Point	15. Quiz 4: Postulates and Theorems
6. Geometry Undefined Terms: Line	16. Special Project
7. Geometry Undefined Terms: Plane	17. Test
8. Quiz 2: Undefined Terms	18. Alternate Test
9. Defined Terms: Definitions	19. Glossary and Credits
10. Quiz 3: Defined Terms	

UNIT 2: LOGIC	
Assignment Titles	
1. Logic	12. Proof Formats: Statement of the Theorem
2. Conjunctions	13. Proof Formats: The Figure
3. Disjunctions	14. Proof Formats: The Given Statement
4. Negation	15. Proof Formats: To Prove Statement
5. Conditional or Implication Statements	16. Proof Formats: The Plan of the Proof
6. Converse, Inverse, Contrapositive	17. Indirect Proof Format: The Paragraph Proof
7. Quiz 1: Principles of Logic	18. Quiz 3: Proof Formats
8. Inductive Reasoning	19. Special Project
9. Deductive Reasoning	20. Test
10. Using Deductive Reasoning	21. Alternate Test
11. Quiz 2: Inductive and Deductive Reasoning	22. Glossary and Credits

UNIT 3: ANGLES AND PARALLELS
Assignment Titles

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|---|---|
| 1. Angle Definitions | 14. More Proofs for Postulates 9 and 10 |
| 2. Angle Measurement | 15. Quiz 3: Parallels and Transversals |
| 3. Quiz 1: Angles | 16. Construction: Perpendiculars |
| 4. Angle Relationship Definitions | 17. Construction: Tangents to Circles |
| 5. Angle Relationship Theorems (1) | 18. Construction: Parallels |
| 6. Angle Relationship Theorems (2) | 19. Classifying Triangles by Sides and Angles |
| 7. Quiz 2: Angle Theorems | 20. Exterior and Remote Interior Angles of a Triangle |
| 8. Construction: Copying Figures | 21. Proofs Involving Triangles |
| 9. Construction: Bisecting Figures | 22. Other Polygons |
| 10. Basic Properties of Parallels | 23. Quiz 4: Triangles, Polygons, and Angle Properties |
| 11. Transversals and Special Angles | 24. Special Project |
| 12. More Proofs: Transversals and Special Angles | 25. Test |
| 13. Continued Proofs: Transversals and Special Angles | 26. Alternate Test |
| | 27. Glossary and Credits |

UNIT 4: CONGRUENT TRIANGLES AND QUADRILATERALS
Assignment Titles

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|---|--|
| 1. Defining Congruent Triangles | 16. Inequality Theorem in One Triangle Part 2 |
| 2. Proving Triangles Congruent (1) | 17. Inequality Theorem in Two Triangles |
| 3. Proving Triangles Congruent (2) | 18. Quadrilateral Parallelograms Theorems Part 1 |
| 4. Proving Right Triangles Congruent | 19. Quadrilateral Parallelograms Theorems Part 2 |
| 5. Quiz 1: Congruent Triangles | 20. Quiz 3: Inequalities; Quadrilaterals |
| 6. Independent Triangles (1) | 21. Triangles that Use Parallelograms in Proofs |
| 7. Independent Triangles (2) | 22. Parallelograms: Rectangles |
| 8. Overlapping Triangles (1) | 23. Parallelograms: Rhombus |
| 9. Overlapping Triangles (2) | 24. Trapezoids-Definitions and Proofs |
| 10. Isosceles Triangles (1) | 25. Quiz 4: Parallelograms; Trapezoids |
| 11. Isosceles Triangles (2) | 26. Special Project |
| 12. Construction of Triangles 30-60-90 | 27. Test |
| 13. Construction of Triangles 45-45-90 | 28. Alternate Test |
| 14. Quiz 2: Types of Triangles | 29. Glossary and Credits |
| 15. Inequality Theorem in One Triangle Part 1 | |

UNIT 5: SIMILAR POLYGONS
Assignment Titles

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|--|---|
| 1. Algebra and Ratios | 15. Using Triangles: Rectangular Solids |
| 2. Algebra Properties and Proportions | 16. Using Triangles: Regular Square Pyramid |
| 3. Properties of Proportions | 17. Trigonometry-Sine Ratio |
| 4. Quiz 1: Ratios, Properties, and Proportions | 18. Trigonometry-Cosine Ratio |
| 5. Meaning of Similarity | 19. Trigonometry-Tangent Ratio |
| 6. Meaning of Similarity-Theorems | 20. Using Similar Triangles in Indirect Measurement |
| 7. Meaning of Similarity-Proofs | 21. Using Trigonometry in Indirect Measure |
| 8. Theorems-Similar Polygons | 22. Quiz 3: Triangles and Trigonometry |
| 9. Theorems-Special Segments in Triangles | 23. Project: Model and Scale Drawing |
| 10. Similar Right Triangles | 24. Special Project |
| 11. The Pythagorean Theorem | 25. Test |
| 12. Theorem about 30-60-90 Right Triangles | 26. Alternate Test |
| 13. Theorem about 45-45-90 Right Triangles | 27. Glossary and Credits |
| 14. Quiz 2: Similarity; Triangle Theorems | |

UNIT 6: SEMESTER REVIEW AND EXAM
Assignment Titles

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|-----------|---------------------------|
| 1. Review | 3. Alternate Exam: Form A |
| 2. Exam | 4. Alternate Exam: Form B |

UNIT 7: CIRCLES
Assignment Titles

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|---------------------------------------|---|
| 1. Characteristics of Circles | 11. Special Angles Type 2 |
| 2. Characteristics of Spheres | 12. Special Angles Type 3 |
| 3. Quiz 1: Circles and Spheres | 13. Special Segments |
| 4. Tangents | 14. Quiz 3: Special Angles and Segments |
| 5. Arcs | 15. Construction: Circles |
| 6. Chords | 16. Special Project |
| 7. Theorems (1) | 17. Test |
| 8. Theorems (2) | 18. Alternate Test |
| 9. Quiz 2: Tangents, Arcs, and Chords | 19. Glossary and Credits |
| 10. Special Angles Type 1 | |

UNIT 8: AREA AND VOLUME
Assignment Titles

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|------------------------------------|--------------------------------------|
| 1. Area Concepts of Polygons | 15. Solids: Prisms |
| 2. Area of Rectangles | 16. Solids: Pyramids |
| 3. Area of Parallelograms | 17. Solids: Cylinders |
| 4. Area of Triangles and Rhombuses | 18. Solids: Cones |
| 5. Area of Trapezoids | 19. Solids: Spheres |
| 6. Area of Regular Polygons | 20. Quiz 3: Volume of Solids |
| 7. Area Comparisons of Polygons | 21. Construction: Dividing a Segment |
| 8. Quiz 1: Area of Polygons | 22. Construction: 4th Proportion |
| 9. Construction: Polygons | 23. Construction: The Geometric Mean |
| 10. Circles: Circumference and PI | 24. Special Project |
| 11. Circles: Area of Circles | 25. Test |
| 12. Circles: Area of Sectors | 26. Alternate Test |
| 13. Circles: Area of Segments | 27. Glossary and Credits |
| 14. Quiz 2: Area of Circles | |

UNIT 9: COORDINATE GEOMETRY
Assignment Titles

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|--|---|
| 1. Symmetry | 11. Equations of Lines |
| 2. Ordered Pairs: Points in a Plane | 12. Quiz 3: Slope and Lines |
| 3. Graphs of Algebraic Sentences | 13. Figures in the Coordinate Plane |
| 4. Quiz 1: Symmetry, Ordered Pairs, and Graphs | 14. Proofs with Coordinate Geometry (1) |
| 5. Distance Formula | 15. Proofs with Coordinate Geometry (2) |
| 6. Equation of a Circle | 16. Quiz 4: Figures and Proofs |
| 7. Midpoint Formula | 17. Special Project |
| 8. Quiz 2: Distance Formula and Applications | 18. Test |
| 9. Slope | 19. Alternate Test |
| 10. Parallel and Perpendicular Lines | 20. Glossary and Credits |

UNIT 10: TRANSFORMATIONS
Assignment Titles

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|--|--|
| 1. Introduction: Rigid Motion, or Isometry | 8. Inverse and Identity Transformation |
| 2. Isometry: Reflection | 9. Quiz 2: Transformations |
| 3. Isometry: Translation | 10. Special Project |
| 4. Isometry: Rotation | 11. Test |
| 5. Quiz 1: Isometry | 12. Alternate Test |
| 6. Dilaton: Congruence and Similarity | 13. Glossary and Credits |
| 7. Product Transformation | |

UNIT 11: REVIEW
Assignment Titles

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|---|----------------------------------|
| 1. Geometry as a System | 9. Area and Volume |
| 2. Geometry Proofs | 10. Coordinate Geometry |
| 3. Angle Relationships and Parallels | 11. Quiz 3: Review: Units 7,8,10 |
| 4. Quiz 1: Review: Units 1-3 | 12. Special Project |
| 5. Congruent Triangles and Quadrilaterals | 13. Test |
| 6. Similar Polygons | 14. Alternate Test |
| 7. Circles | 15. Glossary and Credits |
| 8. Quiz 2: Review: Units 4,5,7 | |

UNIT 12: SEMESTER REVIEW AND EXAM**Assignment Titles**

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|-----------|---------------------------|
| 1. Review | 3. Alternate Exam: Form A |
| 2. Exam | 4. Alternate Exam: Form B |

UNIT 13: FINAL EXAM**Assignment Titles**

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|---------------------------|---------------------------|
| 1. Final Exam | 3. Alternate Exam: Form B |
| 2. Alternate Exam: Form A | |