

# Geometry Syllabus (First Semester)

## Unit 1: Algebra review

Lesson 01: Solving linear equations and inequalities

Lesson 02: Solving systems of two linear equations

Lesson 03: Trinomial factoring

Lesson 04: Special factoring formulas

$$a^2 - b^2; a^2 \pm 2ab + b^2$$

Lesson 05: Solving quadratic equations

Unit 1 review

Unit 1 test

## Unit 2: Basic definitions & concepts (points, lines, and planes)

Lesson 01: Definitions & conventions

Lesson 02: Postulates concerning points, lines, & planes

Practice with points, lines, and planes

Lesson 03: Distance on a number line

Length of a line segment

Lesson 04: Midpoint of a line segment (midpoint formula)

Lesson 05: Line segment bisectors

Unit 2 review

Unit 2 test

## Unit 3: Angles

Lesson 01: Angle fundamentals

Lesson 02: Special angle pairs, perpendicular lines

Supplementary and complementary angles

Lesson 03: Angle word problems

Lesson 04: Construction fundamentals

Copying segments & angles; bisecting segments & angles

Cumulative review, unit 3

Review 3

Unit 3 test

#### **Unit 4: Parallel lines & planes and transversals**

Lesson 01: Parallel lines & planes fundamentals

Definitions of transversal angle pairs

Lesson 02: Parallel lines cut by a transversal.

Lesson 03: More practice with parallel lines and transversals

Same-side angles

Lesson 04: Parallel line construction

Parallel lines: multiple variable problems

Cumulative review

Unit 4 review

Unit 4 test

#### **Unit 5: Triangles & other Polygons**

Lesson 01: Triangle fundamentals

Sum of the interior angles ( $180^\circ$ )

Lesson 02: Triangle inequalities

Constructing a triangle

Lesson 03: Polygons (interior angles)

Lesson 04: Exterior angles of a polygon

Cumulative review

Unit 5 review

Unit 5 test

#### **Unit 6: Quadrilaterals**

##### **Parallelograms & Trapezoids**

Lesson 1: Parallelogram fundamentals

Lesson 2: Rectangles

Lesson 3: Rhombi & squares

Lesson 4: Trapezoids

Cumulative review

Unit 6 review

Unit 6 test

## **Unit 7: Right triangles**

### **Trigonometric ratios (sine, cosine, & tangent)**

Lesson 1: The Pythagorean Theorem

Lesson 2: Pythagorean triples  
Converse of the Pythagorean Theorem

Lesson 3: A special triangle (45-45-90)  
Introduction to trig ratios

Lesson 4: Another special triangle (30-60-90)

Lesson 5: Trig ratios in right-triangles  
Word problems using trig

Lesson 6: Solutions of non-right-triangles  
Sine Law, Cosine Law, and Area Formula

Cumulative review

Unit 7 review

Unit 7 test

## **Unit 8: Ratios, Proportional Parts**

### **Similar Polygons, Dilations**

Lesson 1: Practice with ratios and proportions  
Associated word problems

Lesson 2: Similar polygons

Lesson 3: Similar triangles  
AA, SAS, & SSS similarity

Lesson 4: Dilations

Lesson 5: Indirect measurement word problems

Lesson 6: Proportional parts produced by parallel lines

Lesson 7: More parallel lines and proportional segments

Line joining midpoints of triangle sides

Cumulative review

Unit 8 review

Unit 8 test

### **Unit 9: Area and perimeter**

Lesson 1: Rectangle area, perimeter, and diagonal

Lesson 2. Parallelogram area and perimeter

Lesson 3: Triangle area and perimeter

Lesson 4: Rhombus area and perimeter

Lesson 5: Trapezoid area and perimeter

Unit 9 review

Unit 9 test

### **Semester summary**

Semester review

Semester test

### **In-depth Topics**

**Topic A:** Sign rules

**Topic B:** Derivation of the quadratic formula

**Topic C:** Conic section applications and equation derivations

**Topic D:** Euclidean/non-Euclidean geometry

**Topic E:** Constructions

**Topic F:** Exterior Angle Sum Theorem

**Topic G:** Interior Angle Sum Theorem

**Topic H:** Derivation of the Sine Law

**Topic I:** Derivation of the Cosine Law

**Topic J:** Derivation of a triangle area formula

**Topic K:** Analytic Geometry and the use of equations in geometry

**Topic L:** Area & volume density and associated unit conversions

**Topic M:** Deductive and inductive reasoning

**Topic N:** Area of a regular polygon by apothem and perimeter

**Topic O:** Tessellations

**Topic P:** Fractals