Syllabus — Math 8: Introduction to Geometry

Scholars Math 8: Introduction to Geometry is a complete 36-week curriculum for highly motivated students willing to face hard problems. The course covers a full geometry curriculum along with many advanced problem-solving applications not found in a standard geometry class. Topics covered include triangle similarity and congruence, complicated area problems, mastering the triangle, special quadrilaterals, polygons, the art of angle chasing, construction, power of a point, 3-dimensional geometry, transformations, analytic geometry, basic trigonometry, and geometric proofs.

Textbook(s):

Scholars Math 8 requires *Introduction to Geometry*, by Richard Rusczyk.

Sample Problems:

- Point X is on diameter $\overline{PQ}$ of a circle. Prove that if $\overline{AB}$ is a chord of the circle parallel to $\overline{PQ}$, then $XA^2 + XB^2 = XP^2 + XQ^2$.

- (Scholars Problem) Suppose I is the incenter of $\triangle ABC$. Let points D, E, and F be the feet of altitudes from I to $\overline{BC}$, $\overline{AC}$, and $\overline{AB}$. Prove that $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ are concurrent.

Common Core State Standards (High School):

Domain	Subdomain	Standards
Algebra	Reasoning with Equations and Inequalities	7
Functions	Trigonometric Functions	3
Geometry	Congruence	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
	Similarity, Right Triangles, & Trigonometry	1ab, 2, 3, 4, 5, 6, 7, 8
	Circles	1, 2, 3, 4, 5
	Expressing Geometric Properties with Equations	1, 4, 5, 6, 7
	Geometric Measurement & Dimension	1, 2, 3, 4
	Modeling with Geometry	3

Time Commitment: 24 lessons, 1.5 in-class hours + 4–5 hours of homework per lesson.

Content:

Lesson	Scholars Topic
1	Angles
2	Triangle Angles and Congruent Triangles
3	Isosceles & Equilateral Triangles, Perimeter, and Area
4	Similar Triangles
5	Similar Triangles and Right Triangles
6	More Right Triangles!
7	Special Parts of a Triangle
8	Special Parts of a Triangle, Continued!
9	Quadrilaterals
10	More Quadrilaterals
11	Polygons
12	Geometric Inequalities
13	Introduction to Circles
14	Circles and Angles
15	Tangents
16	Power of a Point
17	3D Geometry Part 1
18	3D Geometry Part 2
19	Transformations
20	Analytic Geometry
21	More Analytic Geometry
22	Basic Trigonometry
23	Problems!
24	More Problems!