

Scholars Math 10.1: Olympiad Geometry covers numerous topics of geometry useful for Olympiad-level geometric proofs, including similar triangles, cyclic quadrilaterals, power of a point, homothety, inversion, transformations, collinearity, concurrence, construction, locus, and three-dimensional geometry.

This course is specifically designed for high-performing students and draws material from many programs for top high school students in the country. Our philosophy is that students develop more by learning to solve problems they haven't seen before, as opposed to offering repeated drills that students can memorize their way through. In this way, our classes are structured much more like courses at top-tier colleges.

Textbook(s): Scholars Math 10.1 does not have a required textbook.

Sample Problems:

- ▶ A convex quadrilateral $ABCD$ is given for which $\angle ABC + \angle BCD < 180$. \overline{AB} and \overline{CD} extended meet at E . Prove that $\angle ABC = \angle ADC$ if and only if $AC^2 = (CD)(CE) - (AB)(AE)$.
- ▶ Let A, B, C , and D be four distinct points on a line, in that order. Circles with diameters \overline{AC} and \overline{BD} intersect at X and Y . The line XY meets BC at Z . Let P be a point on the line XY other than Z . The line CP intersects the circle with diameter \overline{AC} at C and M , and the line BP intersects the circle with diameter \overline{BD} at B and N . Prove that lines \overline{AM} , \overline{DN} , and \overline{XY} are concurrent.
- ▶ Squares of centers P, Q , and R are constructed on the sides of a triangle ABC outside the triangle. Squares of centers X, Y , and Z are constructed on the sides of the triangle PQR inside the triangle. Prove that X, Y , and Z are the midpoints of the sides of triangle ABC .

Time Commitment: 12 lessons, 2 in-class hours + 4–5 hours of homework per lesson.

Grading: 89% Writing Challenge Problems (proofs), and 11% Class Participation.

Content:

Lesson	Scholars Topic
1	Fundamentals: Similar Triangles, Power of a Point, and Cyclic Quadrilaterals
2	Fundamentals Continued
3	Homothety
4	Parts of a Triangle & Construction Introduction
5	Construction
6	Locus
7	Ceva and Menalaus
8	Power of a Point and Radical Axis
9	3-D Geometry
10	Transformations
11	Trigonometry
12	Inversion