This course consists of 20, 1 hour online classes custom designed using primary influence from ***the Art of Problem Solving - Geometry*** course materials. All of the listed contents will be discussed in depth and students can be expected to be confident in every listed subject under "Lesson Topics" by the end of the course. This course does not assign homework for the vast majority of weeks, and most classes will end with an engaging quiz for the students called a Kahoot or Blooket. All scores and engagement on the kahoots and tests will be recorded by scraping algorithms that I (the instructor) created, and if at any point you are looking for more information on how your child is doing - do not hesitate to reach out as we have a plethora of data to satiate your curiosity. All marks on in-class tests will be automatically shared with you, and any homework grades will be available to the students immediately after submitting. Not every class structure is final and they may be subject to change if certain units take less time than expected, but there is certainty that by the end of the 20 weeks all units will have been covered. We hope you choose to learn with us.

Week Number	Lesson Topics
1	● Geometry Summary ○ What's in a name? ○ Burden of proof in mathematics ○ Segments, points, and symbols ● Course Overview and roadmap ● Planes, and the Cartesian plane
2	● Angular calculation ○ Measuring angles ○ Parallel angles and lines ○ Triangulation ○ Exterior and interior angles ● Challenge problems in angular calculation ● Finding the angle problems
3	● Congruent triangles ○ SSS ○ SAS ○ ASA ○ AAS ○ SSA potential congruence ● Isoceles and Equilateral triangles ● Perpendicular bisector ● Challenge problems in scaling and congruency
4	● Perimeter and Area ○ Perimeter ○ Area ○ Same base/same altitude ○ Summary ● In class challenge problem review

5	● Similar Triangles ○ What is similarity? ○ AA Similarity ○ SAS Similarity ○ SSS Similarity ○ Using similarity to your advantage ○ How to apply similarity to scale ● Challenge problems in similarity ● Relations to congruency
6	● Right triangles ○ The pythagorean theorem ○ Special right triangles ○ Pythagorean triples ○ Heron's formula ○ Perpendicular lines ● Summary of concepts ● Relation to congruency and angles ● Challenge problems
7	● Triangle Division and Special Cases ○ Bisectors ○ Perpendicular Bisectors in 2-dimensional space ○ Angular bisectors ○ Medians ○ Altitudes ○ Relative locations ● Challenge problems : bisector construction
8	● Quadrilaterals ○ Trapezoids ○ Parallelograms ○ Rhombi ○ Rectangles ○ Squares ○ If/ only if ● Problems in congruence ● Bisection in quadrilaterals ● Challenge problems
9	● Polygons ○ Angles in a polygon ○ Symmetry in polygonal theorems ○ Polygon area ○ Polygon interior vs exterior angles ● Polygon problems ● Construction and extrapolation of total angles

10	● Summary class ○ Full class for review of weeks 1-9 ○ Check-in to make sure students are caught up and prepared to move onto harder units ● Opportunity for new students that are older or more advanced to join in comfortably at this point
11	● Circles ○ Arc measure, Arc length ○ Circumference ○ Area in a circle ○ Irregular areas and subtractive calculations ● Challenge problems
12	● Circles pt. 2 ○ Advanced area problems ○ Angular calculations within a circle ○ Inscribed angles ○ Angles inside and outside circles ○ Tangents ○ Problems with Angular bisection ● Challenge problems
13	● Points ○ The cartesian plane ○ Power of a point, and distances between them ○ What is ‘the power of a point’? ● Geometric inequalities ○ Pythagorean in non-right triangles ○ The triangle inequality ○ Sides and angles of a triangle ● Challenge problems
14	● Three Dimensional geometry ○ Planes in 2 and 3D ○ The expanded cartesian ○ Prisms ○ Pyramids ○ Regular Polyhedra ● Challenge problems and volume
15	● Curver Surfaces ○ Cylinders ○ Cones ○ Spheres ● Parabolic projections

	● Area under the curve ● Introduction to calculus ● Challenge problems
16	● Change and Translations ○ Translations ○ Rotatations ○ Axial movement, what is an axis? ○ Dilation ○ Construction of transformation ● Challenge problems
17	● Analytic Geometry ● Lines ● Circles ● Basic Analytic Geometry Problems ○ Proofs with analytic geometry ● Distance from a point to a line, and normals ● Matrix algebra ● Advanced analytic geometry problems
18	● Introduction to trigonometry ○ Right angles and their importance ○ Use in non-right triangles ○ Sines ○ Cosines ○ Tangents ○ Real world applications ● Summary and challenge problems
19	● Geometry in practice ● Problem solving strategies in geometry ○ Adding an extra line ○ Bisection strategy ○ Additional variables ○ Proofs of correctness ○ Induction, weak and strong ● Summary of applicability ● Extra hard challenge problems
20	● Summary class ○ Full class for review of weeks 10-19 ○ Check-in to make sure students are caught up and prepared to move onto harder units ● Basic introduction to functional trigonometry ● Online test to assess learning throughout course, with marks shared with parents for transparency of learning efficiency