

Performing transformations

- Intro to Euclidean geometry
- Introduction to rigid transformations
- Translations
- Rotations
- Reflections
- Dilations

Transformation properties and proofs

- Rigid transformations overview
- Dilation preserved properties
- Properties & definitions of transformations
- Symmetry
- Proofs with transformations

Congruence

- Transformations & congruence
- Triangle congruence from transformations
- Congruent triangles
- Theorems concerning triangle properties
- Working with triangles
- Theorems concerning quadrilateral properties
- Proofs of general theorems
- Constructing lines & angles

Similarity

- Definitions of similarity
- Introduction to triangle similarity
- Similarity Solving similar triangles
- Angle bisector theorem
- Solving problems with similar & congruent triangles
- Proving relationships using similarity
- Solving modeling problems with similar & congruent triangles

Right triangles & trigonometry

- Pythagorean theorem
- Pythagorean theorem proofs
- Special right triangles
- Ratios in right triangles

- Introduction to the trigonometric ratios
- Solving for a side in a right triangle using the trigonometric ratios
- Solving for an angle in a right triangle using the trigonometric ratios
- Sine & cosine of complementary angles
- Modeling with right triangles

Non-right triangles & trigonometry (Advanced)

- Law of sines
- Law of cosines
- Solving general triangles

Analytic geometry

- Distance and midpoints
- Dividing line segments
- Problem solving with distance on the coordinate plane
- Parallel & perpendicular lines on the coordinate plane
- Equations of parallel & perpendicular lines

Conic sections

- Graphs of circles intro
- Standard equation of a circle
- Expanded equation of a circle
- Focus and directrix of a parabola

Circles

- Circle basics
- Arc measure
- Arc length (from degrees)
- Introduction to radians
- Arc length (from radians)
- Sectors Inscribed angles
- Inscribed shapes problem solving
- Proofs with inscribed shapes
- Properties of tangents
- Constructing regular polygons inscribed in circles
- Constructing circumcircles & incircles



Mathematics - High School Geometry

- Constructing a line tangent to a circle

Solid geometry

- 2D vs. 3D objects
- Cavalieri's principle and dissection methods
- Volume and surface area
- Density