

Indiana Tutorials are designed specifically for the Indiana Academic Standards to prepare students for the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) End-of-Course Assessments (ECAs).

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

1. POINTS, LINES, AND ANGLES

• POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES

- **G.LP.1** Understand and describe the structure of and relationships within an axiomatic system (undefined terms, definitions, axioms and postulates, methods of reasoning, and theorems). Understand the differences among supporting evidence, counterexamples, and actual proofs.
- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.PL.1** Identify, justify, and apply properties of planes.

• PARALLEL AND PERPENDICULAR LINES

- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.PL.4** Know that parallel lines have the same slope and perpendicular lines have opposite reciprocal slopes. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in coordinate graphs and in equations. Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.

• PARALLEL LINES AND ANGLE RELATIONSHIPS

- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.
- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.

• PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS

- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.
- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.
- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.

2. COORDINATE GEOMETRY

• SLOPE-INTERCEPT FORM OF A LINEAR EQUATION

- **G.PL.4** Know that parallel lines have the same slope and perpendicular lines have opposite reciprocal slopes. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in coordinate graphs and in equations. Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.

• POINT-SLOPE FORM OF A LINEAR EQUATION

- **G.PL.4** Know that parallel lines have the same slope and perpendicular lines have opposite reciprocal slopes. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in coordinate graphs and in equations. Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.

• LENGTH AND THE DISTANCE FORMULA

- **G.T.8** Develop the distance formula using the Pythagorean Theorem. Find the lengths and midpoints of line segments in one- or two-dimensional coordinate systems. Find measures of the sides of polygons in the coordinate plane; apply this technique to compute the perimeters and areas of polygons in real-world and mathematical problems.

• CONJECTURES IN COORDINATE GEOMETRY

- **G.LP.1** Understand and describe the structure of and relationships within an axiomatic system (undefined terms, definitions, axioms and postulates, methods of reasoning, and theorems). Understand the differences among supporting evidence, counterexamples, and actual proofs.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.
- **G.QP.2** Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.

3. PERIMETER, AREA, AND TRANSFORMATIONS ON THE COORDINATE PLANE

• TRANSFORMATIONS ON THE COORDINATE PLANE

- **G.TR.1** Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.
- **G.T.4** Given two triangles, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides, and to establish the AA criterion for two triangles to be similar.
- **G.TR.2** Understand a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.

- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**

- **G.TR.1** Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.
- **G.T.4** Given two triangles, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides, and to establish the AA criterion for two triangles to be similar.
- **G.TR.2** Understand a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- **G.TS.3** Know properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres; solve problems involving congruent and similar solids.

4. CONGRUENCE AND SIMILARITY

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**

- **G.T.5** Use properties of congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.
- **G.TR.1** Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.
- **G.T.2** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

- **TRIANGLES AND SIMILARITY TRANSFORMATIONS**

- **G.T.4** Given two triangles, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides, and to establish the AA criterion for two triangles to be similar.
- **G.T.5** Use properties of congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.
- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.

- **CONGRUENCE OF OTHER POLYGONS**

- **G.TR.1** Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.

5. TRIANGLES

- **TRIANGLE ANGLE THEOREMS**

- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle

theorem and its converse.

- **G.QP.3** Find measures of interior and exterior angles of polygons. Explain and justify the method used.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.

• TRIANGLE BISECTORS

- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.
- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.
- **G.CI.5** Construct a circle that passes through three given points not on a line and justify the process used.
- **G.CI.7** Construct the inscribed and circumscribed circles of a triangle with or without technology, and prove properties of angles for a quadrilateral inscribed in a circle.

• MEDIANS AND ALTITUDES OF TRIANGLES

- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.

6. QUADRILATERALS AND CONSTRUCTIONS

• PARALLELOGRAMS AND RECTANGLES

- **G.QP.1** Prove and apply theorems about parallelograms, including the following: opposite sides are congruent; opposite angles are congruent; the diagonals of a parallelogram bisect each other; and rectangles are parallelograms with congruent diagonals.
- **G.QP.2** Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.

• CONSTRUCTIONS

- **G.PL.5** Explain and justify the process used to construct, with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.), congruent segments and angles, angle bisectors, perpendicular bisectors, altitudes, medians, and parallel and perpendicular lines.
- **G.T.3** Explain and justify the process used to construct congruent triangles with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
- **G.CI.6** Construct a tangent line to a circle through a point on the circle, and construct a tangent line from a point outside a given circle to the circle; justify the process used for each construction.

7. TRIANGLES AND TRIGONOMETRY

• PYTHAGOREAN THEOREM

- **G.T.1** Prove and apply theorems about triangles, including the following: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.

- **G.T.10** Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.

- **TRIGONOMETRIC RATIOS**

- **G.T.9** Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
- **G.T.10** Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.

- **LAWS OF SINE AND COSINE**

- **G.T.10** Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.
- **G.T.7** State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. Understand and use the geometric mean to solve for missing parts of triangles.

- **RADIANS AND THE UNIT CIRCLE**

- **G.CI.2** Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius; derive the formula for the area of a sector.
- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.

8. CIRCLES

- **CIRCLE BASICS**

- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.
- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.
- **G.CI.3** Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship that exists between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to a tangent where the radius intersects the circle.
- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.

- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**

- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.
- **G.CI.3** Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship that exists between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to a tangent where the radius intersects the circle.
- **G.CI.4** Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).
- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.
- **G.CI.5** Construct a circle that passes through three given points not on a line and justify the process used.
- **G.CI.7** Construct the inscribed and circumscribed circles of a triangle with or without technology, and prove properties of angles for a quadrilateral inscribed in a circle.

- **SECANTS, ANGLES, AND INTERCEPTED ARCS**

- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.
- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.
- **G.CI.4** Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).
- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.
- **G.CI.3** Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship that exists between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to a tangent where the radius intersects the circle.

- **TANGENTS, ANGLES, AND INTERCEPTED ARCS**

- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.
- **G.CI.4** Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).
- **G.PL.3** Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.
- **G.LP.4** Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.
- **G.CI.3** Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship that exists between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to a tangent where the radius intersects the circle.

9. PROPERTIES OF CIRCLES

- **CONGRUENT AND SIMILAR CIRCLES**

- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.TR.1** Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.
- **G.T.4** Given two triangles, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides, and to establish the AA criterion for two triangles to be similar.
- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.

- **CIRCUMFERENCE AND ARC LENGTH**

- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.QP.5** Deduce formulas relating lengths and sides, perimeters, and areas of regular polygons. Understand how limiting cases of such formulas lead to expressions for the circumference and the area of a circle.
- **G.CI.4** Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles

and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).

- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.

- **AREA OF CIRCLES AND SECTORS**

- **G.CI.4** Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).
- **G.QP.5** Deduce formulas relating lengths and sides, perimeters, and areas of regular polygons. Understand how limiting cases of such formulas lead to expressions for the circumference and the area of a circle.
- **G.CI.2** Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius; derive the formula for the area of a sector.
- **G.LP.2** Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.
- **G.CI.1** Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.

10. SURFACE AREA

- **SURFACE AREA AND VOLUME OF SPHERES**

- **G.TS.9** Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
- **G.TS.5** Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.
- **G.TS.4** Describe sets of points on spheres, including chords, tangents, and great circles.
- **G.TS.1** Describe relationships between the faces, edges, and vertices of three-dimensional solids. Create a net for a given three-dimensional solid. Describe the three-dimensional solid that can be made from a given net (or pattern).

- **SURFACE AREA OF SIMILAR SOLIDS**

- **G.TS.3** Know properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres; solve problems involving congruent and similar solids.
- **G.TS.5** Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.
- **G.TS.6** Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

11. VOLUME

- **RELATING TWO-DIMENSIONAL FIGURES TO THREE-DIMENSIONAL SOLIDS**

- **G.TS.9** Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

- **VOLUME OF PRISMS AND PYRAMIDS**

- **G.TS.5** Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.
- **G.TS.1** Describe relationships between the faces, edges, and vertices of three-dimensional solids. Create a net for a given three-dimensional solid. Describe the three-dimensional solid that can be made from a given net (or pattern).

- **VOLUME OF CYLINDERS AND CONES**

- **G.TS.5** Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.

- **G.TS.1** Describe relationships between the faces, edges, and vertices of three-dimensional solids. Create a net for a given three-dimensional solid. Describe the three-dimensional solid that can be made from a given net (or pattern).
- **G.TS.6** Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

- **VOLUME OF SIMILAR SOLIDS**

- **G.TS.3** Know properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres; solve problems involving congruent and similar solids.
- **G.TS.5** Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.
- **G.TS.6** Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).