

# Catoosa County Public Schools

## Teaching and Learning Standards

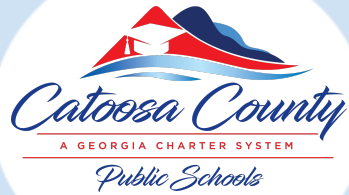
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### District Essential Standards and Learning Targets

**3.3 Use geometric descriptions of rigid motions to draw the transformed figures and to predict the effect on a given figure. Describe a sequence of transformations from one figure to another and use transformation properties to determine congruence.**

- I can draw the transformed figure when given a geometric figure and a specific transformation.
- I can identify the type of transformation and write a rule to describe it when given a preimage and an image.
- I can identify the line of reflection.
- I can specify a sequence of transformations that will carry one figure onto another.
- I can develop the definitions and/or coordinates of each transformation (rotations, reflections, translations) in regards to the characteristics between pre-image and image points.
- I can use functional notation to represent transformations in the coordinate plane.



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### **3.4 Explain how the criteria for triangle congruence follow from the definition of congruence in terms of rigid motions. Use congruency criteria for triangles to solve problems and to prove relationships in geometric figures.**

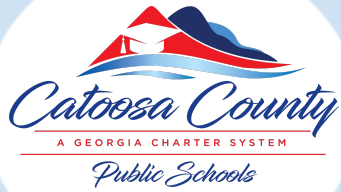
- I can recall postulates, theorems, and definitions to prove theorems about triangles.
- I can prove the Side-Side-Side Triangle Congruence Postulate.
- I can prove the Side-Angle-Side Triangle Congruence Postulate.
- I can prove the Angle-Side-Angle Triangle Congruence Postulate.
- I can prove the Angle-Angle-Side Triangle Congruence Postulate.
- I can prove the Hypotenuse-Leg Triangle Congruence Postulate.
- I can identify missing information needed to prove triangles are congruent.
- I can determine missing sides/angles in congruent triangles.
- I can identify when to use the Properties of Equality (Addition, Subtraction, Multiplication, Division, and Substitution).
- I can identify when to use the Properties of Congruence (Symmetric, Reflexive, and Transitive).

### **4.2 Classify quadrilaterals in the coordinate plane by proving simple geometric theorems algebraically.**

- I can prove the opposite sides are parallel using slope formula.
- I can prove segments are congruent using the distance formula.
- I can prove that the diagonals bisect each other using the midpoint formula.
- I can prove if angles are right angles using slope.

### **4.4 Prove and apply theorems about lines and angles to solve problems.**

- I can use visual tools and/or two column proofs to determine vertical angles are congruent.
- I can use visual tools and/or two column proofs to prove alternate interior angles are congruent.
- I can use visual tools and/or two column proofs to prove corresponding angles are congruent.



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### **4.5 Use geometric reasoning to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.**

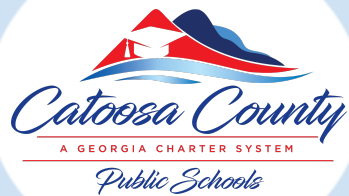
- I can set up and solve equations from the angle relationship - complementary angles.
- I can set up and solve equations from the angle relationship - supplementary angles.
- I can set up and solve equations from the angle relationship - linear pairs.
- I can set up and solve equations from the angle relationship - Triangle Sum Theorem.
- I can set up and solve equations from the angle relationship - Exterior angle of a triangle theorem.
- I can set up and solve equations from the angle relationship - Corresponding angles are congruent.
- I can set up and solve equations from the angle relationship - Alternate interior angles are congruent.
- I can set up and solve equations from the angle relationship - Alternate exterior angles are congruent.
- I can set up and solve equations from the angle relationship - same side interior angles supplementary.
- I can set up and solve equations from the angle relationship - Same-side exterior angles are supplementary.

### **5.3 Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.**

- I can recall postulates, theorems, and definitions to prove theorems about similar triangles (AA, SSS, and SAS).
- I can identify missing information needed to prove triangles are similar.
- I can determine missing sides/angles for similar triangles.
- I can identify when to use the following:
  - Properties of Equality (Addition, Subtraction, Multiplication, Division, and Substitution)
  - Properties of Congruence (Symmetric, Reflexive, and Transitive).

### **5.4 Construct formal proofs to justify and apply theorems about triangles.**

- I can prove the Triangle Proportionality Thm.
- I can prove the Midsegment Thm.
- I can prove the Angle Bisector Thm.



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### **6.3 Use trigonometric ratios and the Pythagorean Theorem to solve for sides and angles of right triangles in applied problems.**

- I can correctly label the legs and hypotenuse of a right triangle.
- I can correctly label the opposite/adjacent sides, given a reference angle  $\Theta$  (theta), and the hypotenuse of a triangle.
- I can determine when to use Pythagorean Theorem as opposed to Trigonometric Ratios.
- I can use trigonometric ratios and/or Pythagorean Theorem to solve for a missing side/angle of a right triangle.
- I can use trigonometric ratios and/or the Pythagorean Theorem to solve applied problems (including angles of elevation and depression).

### **7.3 Use special right triangles on the unit circle to determine the values of sine, cosine, and tangent for $30^\circ$ ( $\pi/6$ ), $45^\circ$ ( $\pi/4$ ), and $60^\circ$ ( $\pi/3$ ) angle measures. Use reflections of triangles to determine reference angles and identify coordinate values in of the coordinate plane.**

- I can find the missing side of a special right triangle.
- I can find the values of sin, cos, and tan at 30, 45, 60 degrees using special right triangles.

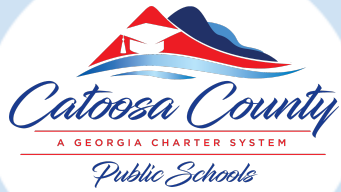
### **8.2 Using similarity, derive the fact that the length of the arc (arc length) intercepted by an angle is proportional to the radius; derive the formula for the area of a sector. Solve mathematically applicable problems involving applications of arc length and area of sector.**

- I can discover that the arc length and sector area are proportional to the radius of its circle.
- I can solve arc length and area of sector problems with one unknown.

### **8.3 Write and graph the equation of circles in standard form.**

- I can identify the center and radius of a circle from a graph and use that information to write the equation of the circle.
- I can identify the center and radius from the standard form equation and use that information to graph the circle.





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### 9.1 Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids.

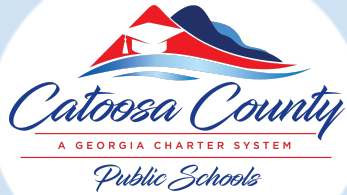
- I can match a solid to its name and volume formula.
- I can distinguish between height and slant height.
- I can use volume formulas for prisms, cylinders, pyramids, cones, & spheres.
- I can use the appropriate units.
- I can use Cavalieri's Principle to find the volume of an oblique solid.

### 2.3 Using algebraic reasoning, add, subtract, and multiply single variable polynomials.

- I can write equations and expressions to represent geometric problems with polynomials.
- I can add polynomial expressions with varying degrees.
- I can subtract polynomial expressions with varying degrees.
- I can multiply polynomial expressions with varying degrees.
- I can explain why operations with polynomials expressions are closed.

### 10.1 Describe categories or events as subsets of a sample space using unions, intersections, or complements of other events. Apply the Addition Rule conceptually, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ , and interpret the answers in context.

- I can categorize unions.
- I can categorize intersections.
- I can categorize complements.
- I can categorize subsets of a sample space by creating a Venn Diagram or a Two-Way Frequency Table.
- I can use the Addition Rule.



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**10.2 Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space,  $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$  using contingency tables or tree diagrams.**

- I can use the Multiplication Rule.
- I can create tree diagrams.

**11.2 Use categorical data in two-way frequency tables to calculate and interpret probabilities within the given framework.**

- I can use 2-way frequency tables to calculate probabilities for unions and intersections and conditional probabilities.