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| **Mathematics Standard of Learning** | **Correlation:** Must address each Mathematics Knowledge and Skill (K&S) for the standard. Provide no more than eight correlations for each K&S, including page numbers or other annotation to located content in the text. |
| **G.RLT.2 The student will analyze, prove, and justify the relationships of parallel lines cut by a transversal.** |  |
|  ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Prove and justify angle pair relationships formed by two parallel lines and a transversal, including:
 |  |
| 1. corresponding angles;
 |  |
| 1. alternate interior angles;
 |  |
| 1. alternate exterior angles;
 |  |
| 1. same-side (consecutive) interior angles; and
 |  |
| 1. same-side (consecutive) exterior angles.
 |  |
| 1. Prove two or more lines are parallel given angle measurements expressed numerically or algebraically.
 |  |
| 1. Solve problems by using the relationships between pairs of angles formed by the intersection of two parallel lines and a transversal.
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| **G.RLT.3 The student will solve problems, including contextual problems, involving symmetry and transformation.** |  |
|  ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Locate, count, and draw lines of symmetry given a figure, including figures in context.
 |  |
| 1. Determine whether a figure has point symmetry, line symmetry, both, or neither, including figures in context.
 |  |
| 1. Given an image or preimage, identify the transformation or combination of transformations that has/have occurred. Transformations include:
 |  |
| 1. translations;
 |  |
| 1. reflections over any horizontal or vertical line or the lines *y = x* or *y = -x*;
 |  |
| 1. clockwise or counterclockwise rotations of 90°, 180°, 270°, or 360° on a coordinate grid where the center of rotation is limited to the origin; and
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| 1. dilations, from a fixed point on a coordinate grid.
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| **G.TR.1 The student will determine the relationships between the measures of angles and lengths of sides in triangles, including problems in context.** |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Given the lengths of three segments, determine whether a triangle could be formed.
 |  |
| 1. Given the lengths of two sides of a triangle, determine the range in which the length of the third side must lie.
 |  |
| 1. Order the sides of a triangle by their lengths when given information about the measures of the angles.
 |  |
| 1. Order the angles of a triangle by their measures when given information about the lengths of the sides.
 |  |
| 1. Solve for interior and exterior angles of a triangle, when given two angles.
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| **G.TR.2 The student will, given information in the form of a figure or statement, prove and justify two triangles are congruent using direct and indirect proofs, and solve problems involving measured attributes of congruent triangles.** |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| * 1. Use definitions, postulates, and theorems (including Side-Side-Side (SSS); Side-Angle-Side (SAS); Angle-Side-Angle (ASA); Angle-Angle-Side (AAS); and Hypotenuse-Leg (HL)) to prove and justify two triangles are congruent.
 |  |
| * 1. Use algebraic methods to prove that two triangles are congruent.
 |  |
| * 1. Use coordinate methods, such as the slope formula and the distance formula, to prove two triangles are congruent.
 |  |
| * 1. Given a triangle, use congruent segment, congruent angle, and/or perpendicular line constructions to create a congruent triangle (SSS, SAS, ASA, AAS, and HL).
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| **G.TR.3 The student will, given information in the form of a figure or statement, prove and justify two triangles are similar using direct and indirect proofs, and solve problems, including those in context, involving measured attributes of similar triangles.** |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Use definitions, postulates, and theorems (including Side-Angle-Side (SAS); Side-Side-Side (SSS); and Angle-Angle (AA)) to prove and justify that triangles are similar.
 |  |
| 1. Use algebraic methods to prove that triangles are similar.
 |  |
| 1. Use coordinate methods, such as the slope formula and the distance formula, to prove two triangles are similar.
 |  |
| 1. Describe a sequence of transformations that can be used to verify similarity of triangles located in the same plane.
 |  |
| 1. Solve problems, including those in context involving attributes of similar triangles.
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| **G.TR.4 The student will model and solve problems, including those in context, involving trigonometry in right triangles and applications of the Pythagorean Theorem** |  |
|  ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Determine whether a triangle formed with three given lengths is a right triangle.
 |  |
| 1. Find and verify trigonometric ratios using right triangles.
 |  |
| 1. Model and solve problems, including those in context, involving right triangle trigonometry (sine, cosine, and tangent ratios).
 |  |
| 1. Solve problems using the properties of special right triangles.
 |  |
| 1. Solve for missing lengths in geometric figures, using properties of 45°-45°-90° triangles, where rationalizing denominators may be necessary.
 |  |
| 1. Solve for missing lengths in geometric figures, using properties of 30°-60°-90° triangles, where rationalizing denominators may be necessary.
 |  |
| 1. Solve problems, including those in context, involving right triangles using the Pythagorean Theorem and its converse, including recognizing Pythagorean Triples.
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| **G.PC.1 The student will prove and justify theorems and properties of quadrilaterals, and verify and use properties of quadrilaterals to solve problems, including the relationships between the sides, angles, and diagonals.** |  |
|  *Students will demonstrate the following Knowledge and Skills:* |  |
| 1. Solve problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids.
 |  |
| 1. Prove and justify that quadrilaterals have specific properties, using coordinate and algebraic methods, such as the slope formula, the distance formula, and the midpoint formula.
 |  |
| 1. Prove and justify theorems and properties of quadrilaterals using deductive reasoning.
 |  |
| 1. Use congruent segment, congruent angle, angle bisector, perpendicular line, and/or parallel line constructions to verify properties of quadrilaterals.
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| **G.PC.2 The student will verify relationships and solve problems involving the number of sides and measures of angles of convex polygons.** |  |
|  **Students will demonstrate the following Knowledge and Skills:** |  |
| 1. Solve problems involving the number of sides of a regular polygon given the measures of the interior and exterior angles of the polygon.
 |  |
| 1. Justify the relationship between the sum of the measures of the interior and exterior angles of a convex polygon and solve problems involving the sum of the measures of the angles.
 |  |
| 1. Justify the relationship between the measure of each interior and exterior angle of a regular polygon and solve problems involving the measures of the angles.
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| **G.PC.3 The student will solve problems, including those in context, by applying properties of circles.**  |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Determine the proportional relationship between the arc length or area of a sector and other parts of a circle.
 |  |
| 1. Solve for arc measures and angles in a circle formed by central angles.
 |  |
| 1. Solve for arc measures and angles in a circle involving inscribed angles.
 |  |
| 1. Calculate the length of an arc of a circle.
 |  |
| 1. Calculate the area of a sector of a circle.
 |  |
| 1. Apply arc length or sector area to solve for an unknown measurement of the circle including the radius, diameter, arc measure, central angle, arc length, or sector area
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| **G.PC.4 The student will solve problems in the coordinate plane involving equations of circles.** |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Derive the equation of a circle of given the center and radius using the Pythagorean Theorem.
 |  |
| 1. Solve problems in the coordinate plane involving equations of circles:
 |  |
| 1. given a graph or the equation of a circle in standard form, identify the coordinates of the center of the circle;
 |  |
| 1. given the coordinates of the endpoints of a diameter of a circle, determine the coordinates of the center of the circle.
 |  |
| 1. given a graph or the equation of a circle in standard form, identify the length of the radius or diameter of the circle.
 |  |
| 1. given the coordinates of the endpoints of the diameter of a circle, determine the length of the radius or diameter of the circle.
 |  |
| 1. given the coordinates of the center and the coordinates of a point on the circle, determine the length of the radius or diameter of the circle; and
 |  |
| 1. given the coordinates of the center and length of the radius of a circle, identify the coordinates of a point(s) on the circle.
 |  |
| 1. Determine the equation of a circle given:
 |  |
| * 1. a graph of a circle with a center with coordinates that are integers;
 |  |
| * 1. coordinates of the center and a point on the circle;
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| * 1. coordinates of the center and the length of the radius or diameter;
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| **G.DF.1 The student will create models and solve problems, including those in context, involving surface area and volume of rectangular and triangular prisms, cylinders, cones, pyramids, and spheres.** |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Identify the shape of a two-dimensional cross section of a three-dimensional figure.
 |  |
| 1. Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures.
 |  |
| 1. Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures.
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| 1. Determine unknown measurements of three-dimensional figures using information such as length of a side, area of a face, or volume.
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| **G.DF.2 The student will determine the effect of changing one or more dimensions of a three-dimensional geometric figure and describe the relationship between the original and changed figure.**  |  |
| ***Students will demonstrate the following Knowledge and Skills:*** |  |
| 1. Describe how changes in one or more dimensions of a figure affect other derived measures (perimeter, area, total surface area, and volume) of the figure.
 |  |
| 1. Describe how changes in surface area and/or volume of a figure affect the measures of one or more dimensions of the figure.
 |  |
| 1. Solve problems, including those in context, involving changing the dimensions or derived measures of a three-dimensional figure.
 |  |
| 1. Compare ratios between side lengths, perimeters, areas, and volumes of similar figures.
 |  |