

MASTERY GUIDE GEOMETRY

FIRST TERM

- *identify basic geometric figures given a diagram;
- *extend a geometric pattern;
- *apply the concept of rate of change to solve a real-world problem given a pattern of data;
- *determine the slope given a graph of a linear equation;
- *match a given irrational number to the appropriate point on a number line (e.g., π);
- *order a set of rational and irrational numbers;
- *use appropriate technology to develop geometric and spatial concepts;
- *apply reflexive, transitive, or symmetric properties of equality;
- *determine the distance, midpoint, or slope when given the coordinates of two points (answers must be given in simplified, radical form);
- *determine the measure of an angle using a protractor;
- *use inductive reasoning to make conjectures;
- *use indirect and deductive reasoning to draw a conclusion;
- *solve multistep linear equations applied to geometric figures;
- *solve systems of two linear equations with integral coefficients to find length, width, perimeter, and area of geometric figures;
- *solve systems of two linear equations with integral coefficients to determine if the lines are parallel, intersecting, or coinciding;
- *choose the equations of parallel lines or perpendicular lines given the coordinates (equations written in both slope-intercept and standard form);
- *choose the equations of parallel lines or perpendicular lines given the graphs (equations written in both slope-intercept and standard form);
- *solve problems involving complementary, supplementary, congruent, vertical, or adjacent angles given angle measures expressed algebraically;

- *solve problems involving angles formed when parallel lines are cut by transversals;
- *justify triangle congruence given a diagram (i.e. ASA, SSS, AAS, SAS, or hypotenuse/leg);
- *apply the Triangle Sum Theorem or Exterior Angle Theorem to determine the measures of the angles of a given triangle with the angle measures expressed algebraically;
- *write and defend proofs;
- *identify the appropriate segment of a triangle given a diagram (i.e. median, altitude, angle bisector, perpendicular bisector);
- *construct bisectors of angles and line segments, perpendicular lines, congruent line segments and angles, and perpendicular bisectors using a variety of methods (e.g., patty paper, technology);
- *apply the triangle inequality property to determine if a triangle exists and arrange the sides and angles according to size;
- *identify the graphical representation of the inequality that represents the possible lengths of a third side of a triangle when the other two sides are given;
- *apply the line of best fit given real-world data from geometric figures using technology, (e.g., finding the interior angle sum of polygons when given the number of sides, find the circumference of circles when given the diameter);
- *solve real-world problems using measures of interior or exterior angles of regular polygons;
- *recognize and articulate relationships among families of geometric figures (e.g., quadrilaterals, prisms);
- *compare and contrast quadrilateral properties using a variety of models (e.g., Venn diagrams, family trees, manipulative mobiles);
- *apply properties of quadrilaterals to solve real-world problem given a diagram (opposite sides and angles, consecutive sides and angles, or diagonals);
- *construct parallelograms, rectangles, rhombi, and squares using physical materials and manipulatives;
- *determine whether a figure has been translated, dilated, reflected, or rotated given a diagram;

- * use coordinates to communicate the location of a three-dimensional figure that has been rotated or reflected;
- * choose the three-dimensional geometric object that has been rotated or reflected given a diagram.

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SECOND TERM

- *apply ratio and proportion to solve real-world problems involving polygons, (e.g., scale drawings, similar triangles);
- *identify corresponding parts of similar and congruent geometric figures given a diagram;
- *analyze and compare congruence or similarity relations between triangles or quadrilaterals given a diagram;
- *explore patterns in real-world situations, (e.g., Fibonacci sequence and Golden Ratio);
- *estimate the value of an irrational number expressed as a radical (radicand less than 1000);
- *locate the irrational numbers on a number line by using the Pythagorean relationship and a straightedge and compass;
- *simplify a radical expression (radicand less than 1000);
- *use logical reasoning to solve problems in the real world;
- *use manipulatives to explore the geometric mean of similar triangles;
- *investigate the Pythagorean Theorem by constructing right triangles on a geoboard;
- *determine the length of a missing side in a right triangle when given two sides (answers must be given as simplified radicals);
- *determine if a triangle is acute, obtuse, or right given the length of all the sides of a triangle;
- *solve real-world problems using 30-60-90 or 45-45-90 degree triangles (no irrational denominators);
- *determine the trigonometric ratio for a right triangle needed to solve a real-world problem given a diagram;
- *identify chords, inscribed angles, or central angles of circles given a diagram;
- *investigate the properties of angles, arcs, chords, tangents, and/or secants using technology or manipulatives;
- *solve problems using the properties of angles, arcs, chords, tangents, or secants;
- *apply the concepts of length, perimeter, area, surface area, and volume to two- and three-dimensional figures in real-world situations;

- *apply the properties of angles, arcs, chords, tangents and/or secants to solve problems (with diagrams);
- *determine the equation of a circle given coordinates or the graph of the circle (e.g., the center, the endpoints of the diameter);
- *determine the perimeter or area of a triangle or rectangle when the dimensions are given as binomials in one variable;
- *determine the perimeter or area of a triangle or rectangle (including squares) in a real-world situation given the dimensions as linear algebraic expressions in one variable;
- *approximate pi given a table of values for the circumference and diameter of circles;
- *determine the area of shaded regions involving circles, squares, rectangles, and/or triangles;
- *find the area of a sector or segment of a circle given a diagram;
- *determine which three-dimensional solid is represented by a given net (two-dimensional drawing);
- *construct three-dimensional objects using physical materials and manipulatives;
- *determine the perimeter, area, surface area, or volume given the ratio of two similar geometric figures;
- *use manipulatives to determine relationships between linear, square, or cubic measures when one of the measures of the object has changed;
- *determine the volume or surface area of a rectangular solid in a real-world situation;

- *make a prediction from a geometric representation of a real-world data set;
- *determine the probability of an event using a spinner and a circle graph;
- *explain and justify the given geometric representation of the probability of an event;
- *use hands-on activities to model geometric representations of probability;
- *determine the probability of an event represented as a subset of the area of a two-dimensional geometric figure;
- *choose appropriate techniques and tools to measure quantities in order to meet specifications for precision, accuracy, and tolerance;
- *recognize complete and incomplete networks;
- *solve problems in probability and statistics using algebraic thinking and symbolism;
- *analyze and debate the validity of claims made based on the given theoretical probability of a real-world situation.