High School Math – First Marking Period

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN GEOMETRY

Congruence

I can define *angle*.
I can define *circle*.
I can define *perpendicular lines* and *parallel lines*.
I can define *line segment*.
I can define *distance along a line*.
I can define the distance around a full circular arc (circumference).
I can define the distance around a circular arc.
I can identify the undefined terms.
I can describe a point, line, and plane.
I can create transformations in the plane using manipulatives (e.g., geometry software, patty paper, transparencies).
I can describe transparencies as functions that map points in the plane to other points in the plane.
I can compare transformations that preserve distance and angles to those that do not.
I can describe rotations that take a rectangle, parallelogram, trapezoid, or regular polygon onto itself.
I can describe reflections that take a rectangle, parallelogram, trapezoid, or regular polygon onto itself.
I can create a definition of rotation in terms of angles, circles, perpendicular lines, parallel lines, and segments.
I can create a definition of reflection in terms of angles, circles, perpendicular lines, parallel lines, and segments.
I can create a definition of translation in terms of angles, circles, perpendicular lines, parallel lines, and segments.
I can prove that vertical angles are congruent.
I can prove that alternate interior angles are congruent when two parallel lines are crossed by a transversal.
I can prove that corresponding angles are congruent when two parallel lines are crossed by a transversal.
I can prove that points on a perpendicular bisector of a line segment are equidistant from the endpoints of the segment.
I can prove that the measures of the interior angles of a triangle add to 180^{o}.
I can prove that the base angles of an isosceles triangle are congruent.
I can prove that the segment joining the midpoints of two sides of a triangle is half the length of the third side.
I can copy a segment using formal geometric constructions.
I can copy an angle using formal geometric constructions.
I can bisect a segment using formal geometric constructions.
I can bisect an angle using formal geometric constructions.
I can construct perpendicular lines using formal geometric constructions.
I can construct the perpendicular bisector of a line segment using geometric constructions.
I can construct a line parallel to a given line through a point not on a line using geometric constructions.
I can construct an equilateral triangle.
I can construct a square.
I can construct a regular hexagon inscribed in a circle.

Expressing Geometric Properties with Equations

I can prove that the slopes of parallel lines are equal.

I can prove that the slopes of perpendicular lines are negative multiplicative inverses of each other.

I can use the slopes of perpendicular lines to solve geometric problems.

I can use the slopes of parallel lines to solve geometric problems.

I can find the point on a line segment that is between two points that divides the segment into lengths forming a given ratio.

I can use coordinates to compute perimeters of polygons.

I can use coordinates to compute the area of triangles.

I can use coordinates to compute the area of rectangles.

Modeling with Geometry

I can use geometric shapes to describe objects.

I can use the measures of geometric shapes to describe objects.

I can use the properties of geometric shapes to describe objects.

High School Math – Second Marking Period

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN GEOMETRY

Congruence

I can draw a rotation of a geometric figure using graph paper, tracing paper, or geometry software.

I can draw a reflection of a geometric figure using graph paper, tracing paper, or geometry software.

I can draw a translation of a geometric figure using graph paper, tracing paper, or geometry software.

I can describe a transformation that maps a given figure onto itself.

I can use geometric descriptions of rigid motions to transform figures.

I can predict the effect of a given rigid motion on a given figure.

I can define congruence in terms of rigid motions.

I can use the definition of congruence to decide if two figures are congruent in terms of rigid motions.

I can use two congruent triangles and rigid motions to show corresponding sides and angles are congruent.

I can use congruent corresponding sides and angles of two triangles and rigid motions to show they are congruent.

I can explain how ASA triangle congruence works with rigid motions.

I can explain how SAS triangle congruence works with rigid motions.

I can explain how SSS triangle congruence works with rigid motions.

Modeling with Geometry

I can use geometric shapes to describe objects.

I can use the measures of geometric shapes to describe objects.

I can use the properties of geometric shapes to describe objects.

Continued. . .

Geometry – Second Marking Period

Similarity, Right Triangles, and Trigonometry

I can identify a dilation given by its center and scale factor.

I can verify experimentally that a dilation maps a line not passing through the center to a parallel line.

I can verify experimentally that a dilation leaves a line passing through the center unchanged.

I can verify experimentally that a dilation of a line segment is longer or shorter based on the scale factor.

I can use the definition of similarity with transformations to decide if two figures are similar.

I can explain using transformations that the meaning of similarity of triangles is the equality of corresponding pairs of angles and the proportionality of all corresponding sides.

I can use the properties of similarity transformations to establish AA for similarity to prove two triangles are similar.

I can prove that a line parallel to one side of a triangle divides the other two sides proportionally.

I can prove that a line that divides two sides of a triangle proportionally is parallel to the third side.

I can prove that two triangles are similar by using the Pythagorean Theorem.

I can use congruence criteria for triangles to solve problems.

I can use similarity criteria for triangles to solve problems.

I can use congruence criteria for triangles to prove relationships in geometric figures.

I can use similarity criteria for triangles to prove relationships in geometric figures.

Expressing Geometric Properties with Equations

I can prove that the slopes of parallel lines are equal.

I can prove that the slopes of perpendicular lines are negative multiplicative inverses of each other.

I can use the slopes of perpendicular lines to solve geometric problems.

I can use the slopes of parallel lines to solve geometric problems.

I can find the point on a line segment that is between two points that divides the segment into lengths forming a given ratio.

I can use coordinates to compute perimeters of polygons.

I can use coordinates to compute the area of triangles.

I can use coordinates to compute the area of rectangles.

High School Math – Third Marking Period

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN GEOMETRY

Congruence

I can prove that opposite sides of parallelograms are congruent.

I can prove that opposite angles of parallelograms are congruent.

I can prove that the diagonals of a parallelogram bisect each other.

I can prove that rectangles with congruent diagonals are parallelograms.

Similarity, Right Triangles, and Trigonometry

I can use the Pythagorean Theorem to solve applied problems involving right triangles.

I can use the ratios of side lengths of right triangles to find properties of the angles in the triangle.

I can define the sine ratio for acute angles of right triangles.

I can define the cosine ratio for acute angles of right triangles.

I can define the tangent ratio for acute angles of right triangles.

I can explain the relationship between the sine and cosine of complementary angles in right triangles.

I can use the relationship between the sine and cosine of complementary angles in right triangles.

I can use the sine ratio to solve applied problems involving right triangles.

I can use the cosine ratio to solve applied problems involving right triangles.

I can use the tangent ratio to solve applied problems involving right triangles.

I can use the Pythagorean Theorem to solve applied problems involving right triangles.

I can draw an auxiliary line from a vertex of a triangle perpendicular to the opposite side (an altitude).

I can derive the area formula of a triangle using the sine ratio and an altitude. [A = (1/2)a b sin (C)]

I can prove the Law of Sines.

I can prove the Law of Cosines.

I can use the Law of Sines to solve problems.

I can use the Law of Cosines to solve problems

I can apply the Law of Sines to find unknown measurements in right triangles.

I can apply the Law of Sines to find unknown measurements in non-right triangles.

I can apply the Law of Cosines to find unknown measurements in right triangles.

I can apply the Law of Cosines to find unknown measurements in non-right triangles.

High School Math – Fourth Marking Period

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN GEOMETRY

Circles

I can prove that all circles are similar.

I can identify inscribed angles in circles.

I can identify circumscribed angles.

I can identify central angles of circles.

I can identify a tangent to a circle.

I can identify chords of a circle.

I can identify a secant of a circle.

I can identify the relationships between the measures and locations of central, inscribed, and circumscribed angles.

I can identify inscribed angles that are right angles (involve the diameter).

I can determine that a line is a tangent to a radius of a circle (it is perpendicular).

I can construct an inscribed circle in a triangle using the angle bisectors of the triangle.

I can construct a circumscribed circle around a triangle.

I can prove that opposite pairs of angles in an inscribed quadrilateral (cyclic quadrilateral) are supplementary.

I can construct a tangent line from a point outside a circle to the circle.

I can derive a proportion between the length of an arc intercepted by an angle and the radius using similarity.

I can define the radian measure of an angle.

I can identify the constant of proportionality for two similar figures.

I can derive the formula for the area of a sector.

Expressing Geometric Priorities with Equations

I can derive the equation of a circle using the Pythagorean Theorem given the center and its radius.

I can complete the square to find the center and radius of a circle given an equation.

I can derive the equation of a parabola given a focus and directrix.

I can use coordinates to prove simple geometric theorems algebraically.

Continued. . .

Geometry – Fourth Marking Period

Geometric Measurement and Expressions
I can use coordinates to prove simple geometric theorems algebraically. **I can** identify the shapes of two-dimensional cross-sections that are cut from three-dimensional objects. **I can** identify three-dimensional objects made by rotations of two-dimensional objects.
Modeling with Geometry
I can define density. **I can** apply density in area and volume situations. **I can** apply geometry methods to solve design problems.