Postulate 29.1 Linear Pair Postulate
Two angles that form a linear pair are supplementary and add up to 180°.

Theorem 29.1 Right Angles Congruence Theorem
All right angles are congruent.

Theorem 29.2 Congruent Complements Theorem
Angles complementary to the same angle or to congruent angles are congruent.

Theorem 29.3 Congruent Supplements Theorem
Angles supplementary to the same angle or to congruent angles are congruent.

Theorem 29.4 Vertical Angles Theorem
Vertical angles are congruent.

Postulate 30.1 Corresponding Angles Postulate/Converse
Two lines cut by a transversal are parallel if and only if corresponding angles are congruent.

Theorem 30.1 Alternate Exterior Angles Theorem/Converse
Two lines cut by a transversal are parallel if and only if alternate exterior angles are congruent.

Theorem 30.2 Alternate Interior Angles Theorem/Converse
Two lines cut by a transversal are parallel if and only if alternate interior angles are congruent.

Theorem 30.3 Consecutive Interior Angles Theorem/Converse
Two lines cut by a transversal are parallel if and only if consecutive interior angles are supplementary.

Theorem 31.1 Perpendicular Transversal Theorem
If a line is perpendicular to one of two parallel lines, then it is also perpendicular to the other line.

Theorem 31.2 Perpendicular Transversal Converse
If two lines are perpendicular to the same line, then the lines are parallel to each other.

Theorem 31.3 Linear Pair Perpendicular Theorem
If two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular.

Theorem 32.1 Triangle Sum Theorem
The interior angles of a triangle always add up to 180°.

Theorem 32.2 Triangle Exterior Angle Theorem

An exterior angle of a triangle is equal to the sum of the two non-adjacent interior angles.

Theorem 32.3 Polygon Interior Angles Theorem

The sum of the interior angles of a polygon with n sides is $180°(n - 2)$.

Theorem 32.4 Polygon Exterior Angles Theorem

The sum of the exterior angles of a polygon, one at each vertex, is 360°.

Theorem 35.1 Third Angle Theorem

If two angles in one triangle are congruent to two angles in another triangle, then the third angles are congruent.

Theorem 36.1 Side-Side-Side (SSS) Theorem

If three sides of one triangle are congruent to three sides of another triangle, then the triangles are congruent.

Theorem 36.2 Side-Angle-Side (SAS) Theorem

If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.

Theorem 37.1 Angle-Side-Angle (ASA) Theorem

If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.

Theorem 37.2 Angle-Angle-Side (AAS) Theorem

If two angles and the non-included side of one triangle are congruent to two angles and the corresponding non-included side of another triangle, then the triangles are congruent.

Theorem 38.1 Hypotenuse-Leg (HL) Theorem

If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.

Theorem 40.1 Base Angles Theorem

If two sides of a triangle are congruent, then the angles opposite the sides are congruent.

Theorem 40.2 Base Angles Converse

If two angles of a triangle are congruent, then the sides opposite the angles are congruent.

Theorem 40.3 Equilateral Triangle Theorem

If a triangle is equilateral, then it is equiangular.

Theorem 40.4 Equilateral Triangle Converse

If a triangle is equiangular, then it is equilateral.

Theorem 46.1 Triangle Midsegment Theorem
The midsegment between any two sides of a triangle is parallel to and half the length of the third side.

Theorem 47.1 Perpendicular Bisector Theorem
A point is on the perpendicular bisector of a segment if and only if it is equidistant from the endpoints of the segment.

Theorem 47.2 Circumcenter Theorem
The circumcenter of a triangle is equidistant from the vertices of the triangle.

Theorem 48.1 Angle Bisector Theorem
A point is on the bisector of an angle if and only if it is equidistant from the sides of the angle.

Theorem 48.2 Incenter Theorem
The incenter of a triangle is equidistant from the sides of the triangle.

Theorem 49.1 Centroid Theorem
The centroid of a triangle is two-thirds of the distance from each vertex to the midpoint of the opposite side.

Theorem 52.1 Triangle Side-Angle Theorem
If one side of a triangle is longer than another side, then the angle opposite the longer side is larger than the angle opposite the shorter side.

Theorem 52.2 Triangle Angle-Side Theorem
If one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.

Theorem 52.3 Triangle Inequality Theorem
The sum of the lengths of any two sides of a triangle must be greater than the length of the third side.

Theorem 53.1 Hinge Theorem or SAS Inequality Theorem
If two sides of one triangle are congruent to two sides of another triangle and the included angle of the first is larger than the included angle of the second, then the third side of the first is longer than the third side of the second.

Theorem 53.2 Converse of Hinge Theorem or SSS Inequality Theorem
If two sides of one triangle are congruent to two sides of another triangle and the third side of the first is longer than the third side of the second, then the included angle of the first is larger than the included angle of the second.

Theorem 56.1 Parallelogram Opposite Sides Theorem
Opposite sides of a parallelogram are congruent.

Theorem 56.2 Parallelogram Consecutive Angles Theorem
Consecutive angles in a parallelogram are supplementary.

Theorem 56.3 Parallelogram Opposite Angles Theorem
Opposite angles of a parallelogram are congruent.

Theorem 56.4 Parallelogram Diagonals Theorem
The diagonals of a parallelogram bisect each other.

Theorem 57.1 Parallelogram Opposite Sides Converse
If a quadrilateral has two pairs of opposite sides congruent, then it is a parallelogram.

Theorem 57.2 Parallelogram Opposite Angles Converse
If a quadrilateral has two pairs of opposite angles congruent, then it is a parallelogram.

Theorem 57.3 Parallelogram Diagonals Converse
If a quadrilateral has diagonals that bisect each other, then it is a parallelogram.

Theorem 57.4 Parallel Congruent Sides Theorem
If a quadrilateral has one pair of opposite sides parallel and congruent, then it is a parallelogram.

Theorem 58.1 Rhombus Diagonals Theorem
A parallelogram is a rhombus if and only if its diagonals are perpendicular.

Theorem 58.2 Rhombus Angle Bisector Theorem
A parallelogram is a rhombus if and only if its diagonals bisect opposite angles.

Theorem 58.3 Rectangle Diagonals Theorem
A parallelogram is a rectangle if and only if its diagonals are congruent.

Theorem 59.1 Trapezoid Midsegment Theorem
The midsegment of a trapezoid is parallel to the bases and equal to half the sum of their lengths.

Theorem 59.2 Isosceles Trapezoid Theorem
A trapezoid is isosceles if and only if the base angles are congruent.

Theorem 59.3 Isosceles Trapezoid Diagonals Theorem
A trapezoid is isosceles if and only if its diagonals are congruent.

Theorem 59.4 Kite Angles Theorem
The non-vertex angles of a kite are congruent.

Theorem 59.5 Kite Angle Bisector Theorem
The vertex angles of a kite are bisected by its diagonal.

Theorem 59.6 Kite Diagonals Theorem
The diagonals of a kite are perpendicular.

Theorem 63.1 Angle-Angle (AA) Similarity Theorem
If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

Theorem 64.1 Side-Side-Side (SSS) Similarity Theorem
If the corresponding sides of two triangles are proportional, then the triangles are similar.

Theorem 65.1 Side-Angle-Side (SAS) Similarity Theorem
If an angle of one triangle is congruent to an angle of another triangle and the sides including these angles are proportional, then the triangles are similar.

Theorem 67.1 Right Triangle Similarity Theorem
The altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are similar to each other and to the original triangle.

Theorem 68.1 Altitude Geometric Mean Theorem or Altitude Rule
The altitude to the hypotenuse of a right triangle divides the hypotenuse into two segments. The length of the altitude is the geometric mean of the lengths of the two segments.

Theorem 68.2 Leg Geometric Mean Theorem or Leg Rule
The altitude to the hypotenuse of a right triangle divides the hypotenuse into two segments. The length of a leg of the right triangle is the geometric mean of the lengths of the hypotenuse and the segment of the hypotenuse adjacent to the leg.

Theorem 69.1 Triangle Side Splitter Theorem
A line segment splits two sides of a triangle proportionally if and only if it is parallel to the third side.

Theorem 69.2 Three Parallel Lines Theorem
If three parallel lines intersect two transversals, then they divide the transversals proportionally.

Theorem 70.1 Triangle Angle Bisector Theorem
An angle bisector of a triangle divides the opposite side into two segments that are proportional to the adjacent sides.

Theorem 74.1 Pythagorean Theorem
In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

Theorem 75.1 Converse of Pythagorean Theorem
If the square of the length of the longest side of a triangle is equal to the sum of the squares of the lengths of the other two sides, then the triangle is a right triangle.

Theorem 75.2 Acute Pythagorean Inequality Theorem

If the square of the length of the longest side of a triangle is less than the sum of the squares of the lengths of the other two sides, then the triangle is acute.

Theorem 75.3 Obtuse Triangle Inequality Theorem

If the square of the length of the longest side of a triangle is greater than the sum of the squares of the lengths of the other two sides, then the triangle is obtuse.

Theorem 76.1 45°-45°-90° Triangle Theorem

In a 45°-45°-90° triangle, the legs are congruent and the length of the hypotenuse is $\sqrt{2}$ times the length of a leg. (The sides are in the ratio $1 : 1 : \sqrt{2}$.)

Theorem 76.2 30°-60°-90° Triangle Theorem

In a 30°-60°-90° triangle, the length of the hypotenuse is twice the length of the shorter leg. The length of the longer leg is $\sqrt{3}$ times the length of the shorter leg. (The sides are in the ratio $1 : \sqrt{3} : 2$.)

Theorem 91.1 Tangent-Radius Theorem

A line is tangent to a circle if and only if the line is perpendicular to the radius drawn to the point of tangency.

Theorem 91.2 Two Tangents Theorem

If two tangent segments are drawn to a circle from an external point, then the two segments are congruent.

Theorem 92.1 Arc-Central Angle Theorem

In a circle or in congruent circles, arcs are congruent if and only if their central angles are congruent.

Postulate 92.1 Arc Addition Postulate

The measure of the arc formed by two adjacent arcs is the sum of the measures of the two arcs.

Theorem 93.1 Arc-Chord Theorem

In a circle or in congruent circles, arcs are congruent if and only if their corresponding chords are congruent.

Theorem 93.2 Radius-Chord Theorem

In a circle, a radius is perpendicular to a chord if and only if it bisects the chord and its arc.

Theorem 94.1 Equidistant Chords Theorem

In a circle or in congruent circles, chords are congruent if and only if they are equidistant from the center.

Theorem 95.1 Inscribed Angle Theorem

The measure of an inscribed angle is half the measure of its intercepted arc. Or, the measure of an intercepted arc is twice the measure of its inscribed angle.

Theorem 95.2 Congruent Inscribed Angles Theorem
If two inscribed angles of a circle intercept the same arc or congruent arcs, then the angles are congruent.

Theorem 96.1 Inscribed Right Triangle Theorem
A right triangle is inscribed in a circle if and only if the hypotenuse is a diameter of the circle.

Theorem 96.2 Inscribed Quadrilateral Theorem
If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.

Theorem 97.1 Chord-Tangent Angle Theorem
The measure of an angle formed by a chord and a tangent intersecting on a circle is half the measure of its intercepted arc.

Theorem 97.2 Angles Inside Circle Theorem
The measure of an angle formed by two chords intersecting inside a circle is half the sum of the measures of the arcs intercepted by the angle and its vertical angle.

Theorem 98.1 Angles Outside Circle Theorem
The measure of an angle formed by two secants, two tangents, or a secant and a tangent drawn from a point outside a circle is half the difference of the measures of the intercepted arcs.

Theorem 99.1 Chord-Chord Product Theorem
If two chords intersect in a circle, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other.

Theorem 99.2 Secant-Secant Product Theorem
If two secant segments share an endpoint outside of the circle, then the product of the lengths of one secant segment and its external part is equal to the product of the lengths of the other secant segment and its external part.

Theorem 99.3 Secant-Tangent Product Theorem
If a secant segment and a tangent segment share an endpoint outside a circle, then the product of the lengths of the secant segment and its external part is equal to the square of the length of the tangent segment.