0.1

Distance - A number representing how far between two points.

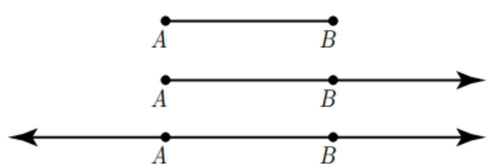
Length - The length of a segment is the distance between the two endpoints.

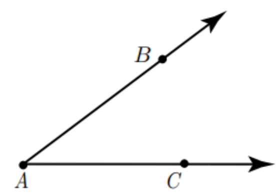
Between - A point, B for example, is between segment AC if and only if AB + BC = AC. This would make the points **collinear**

Congruent - Two segments are congruent if they have the same length. Denoted with ⩭ (but without that annoying dot!)

Ray - A ray has a single endpoint and travels infinitely in one direction

Line - A line has no endpoints and travels indefinitely in opposite directions

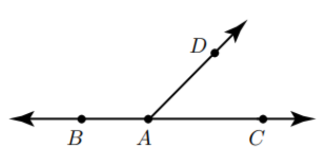


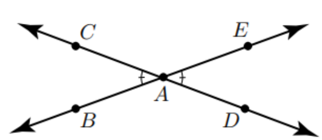


Angle - An angle consists of two rays that share a common endpoint, denoted with ∠. The measure of an angle is a number of degrees between the two rays. The interior angle is less than or equal to 180 degrees and the exterior angle is greater than or equal to 180 degrees.
Acute - An angle measuring less than 90 degrees.
Obtuse - An angle measuring greater than 90 degrees.
Right - An angle measuring exactly 90 degrees.

0.2

Angle Addition Postulate - Ray AD is between rays AB and AC if and only if m∠.BAD + m∠.DAC = m∠BAC
Linear Pair Theorem - If ∠BAD + ∠.DAC = 180 degrees, then the two angles form a linear pair
Vertical Pair - two sets of opposite rays (or a line) that share a common endpoint with two more opposite rays with the same endpoint create a vertical pair

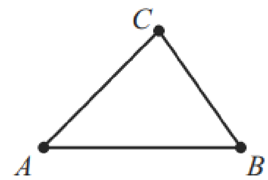




Vertical Angles Theorem - Vertical angles are congruent

<u>0.3</u>

AC, CB, and AB represent sides of the triangle △ABC.



Two triangles are congruent if their corresponding sides and angles are congruent.

Proving triangles are congruent:

Side-Angle-Side (SAS)

Angle-Side-Angle (ASA)

Angle-Angle-Side (AAS)

Side-Side-Side (SSS)

Hypotenuse-Leg (HL)

<u>0.4</u>

Pasch's Axiom - Given triangle ABC, a line that intersects side AB will always intersect either BC or AC assuming the line is not on one of the vertices

Crossbar Theorem - If D is on the interior of ∠BAC, then there is a point G such that G lies on both rays AD and BC

Circle-Line Continuity - If y is a circle and L is a line such that L contains a point inside y, then the intersection of L and y consists of exactly two points

Circle-Circle Continuity - let a and b be two circles. If there is a point of a that is inside b and another point of a outside of b, then the intersection of a and b consists of exactly two points

<u>0.5</u>

Exterior Angle Theorem - The measure of the exterior angle of a triangle is equal to the sum of the other two interior angles.

<u>0.6</u>

Perpendicular Lines - Form right angles. Their slopes are inverse reciprocals

Parallel Lines - Never intersect, their slopes are the same.

Playfair's Postulate - For every line L and every point P that is not on that line, there is exactly one line m that P lines on such that the two lines are parallel.

Alternate Interior Angles Theorem and its Converse - if two lines are cut by a transversal, the alternate interior angles are congruent if and only if the lines are parallel.

Corresponding Angles Theorem and its Converse - if two lines are cut by a transversal, the corresponding angles are congruent if and only if the lines are parallel.

Angle Sum Theorem - the sum of angles in a triangle equal 180 degrees

0.7

Pythagorean Theorem - Given a right triangle with the right angle at vertex C, then $a^2+b^2=c^2$

0.8

Similar Triangle Theorem - If triangles ABC and DEF are similar (use the symbol ~) then their angles are congruent and their corresponding sides are proportional.

Euclid's Proposition - Given triangle ABC where D and E are points on sides AB and AC. Segments DE and BC are parallel if and only if AD and AB are proportional to AE and AC.

SAS~

AA~

0.9

Quadrilateral - four sided shape

Trapezoid - exactly one pair of parallel sides

Parallelogram - diagonals bisect each other, opposite sides are parallel and congruent, consecutive angles are supplementary, opposite angles are congruent, diagonals bisect each other

Rhombus - parallelogram with all sides the same length, diagonals form right angles

Rectangle - parallelogram with diagonals the same length

Square - parallelogram with diagonals that bisect each other and form right angles

0.10

Tangent Line Theorem - Given a circle and a point on the circle, a line tangent to the circle will be perpendicular to the segment formed by the point of tangency and the center

Inscribed Angles Theorem - Two inscribed angles are congruent if their endpoints intercept arcs of the same size.

Central Angle Theorem - Inscribed angles have a measure of one half of the arc intercepted by it and the central angle

Secant Line Theorem - given a circle and a line that intersects it at points P and Q, then the center lies on the perpendicular bisector of chord PQ

External Tangents Theorem - given a circle and L and M are two non parallel lines that are tangent to the circle with A as the point where the tangents intersect, then the length from A to the tangents of the circles are congruent

Thales' Theorem and its Converse - angle ACB is a right angle and the vertices of triangle ABC lie on the circle if and only if AB is a diameter of the circle

<u>0.11</u>

Area of a triangle - equal to one half the base times the height or one half times the length of two sides and the sine of the angle between those two sides