Geometry

Conjectures

<u>3.2.1</u> If a point is on the perpendicular bisector of a segment, then it is _______________________________ from the endpoints**.**

<u>3.3.2 -</u> The shortest distance from a point to a line is measured along the ______________________________ from the point to the line.

<u>3.4.1</u> – If a point is on the bisector of an angle, then it is _________________________________ from the sides of the angle.

3.4.3 – The measure of each angle of an equilateral triangle is ____.

3.8.1 – The three angle bisectors of a triangle ____.

3.8.2 – The three perpendicular bisectors of the sides of a triangle ____.

3.8.3 – The three altitudes (or lines through the altitudes) of a triangle
____.

3.9.1 – The three medians of a triangle ____________________________

3.9.2 – The centroid of a triangle divides each median into two parts so that the distance from the centroid to the vertex is ____________________
_________________ the distance from the centroid to the midpoint**.**

Chapter 4

C-1 (Vertical Angles Conjecture) If two angles are vertical angles, then they are
____

C-2 (Linear Pair Conjecture) If two angles are a linear pair of angles, then they are
____

C-3 (Equal Supplements Conjecture) If two angles are both equal in measure and supplementary, then each angle measures ____________________________

C-4 (Triangle Sum Conjecture) The sum of the measures of the three angles of every triangle is _________________

C-5 (Third Angle Conjecture) If two angles of one triangle are equal in measure to two angles of another triangle, then the remaining two angles

____

C-6 The sum of the measure of the four angles of a quadrilateral is ___________

C-7 (Polygon Sum Conjecture) The sum of the measures of the n angles of an n-gon is

C-8 The measure of each angle of an equiangular n-gon is

C-9 The sum of the measures of one set of exterior angles is ____________________

C-10 (Exterior Angle Conjecture) The measure of an exterior angle of a triangle equals

____

____

C-11 (Triangle Inequality Conjecture) The sum of the lengths of any two sides of a triangle is ________________ the length of the third side.

C-12 In a triangle, ____

____

C-13 (Isosceles Triangle Conjecture) If a triangle is isosceles, then the

____

C-14 (Converse of the Isosceles Triangle Conjecture) If a triangle has two angles of equal measure, then ____

C-15 (Equilateral Triangle Conjecture) An equilateral triangle is ______________ and, conversely, an equiangular triangle is ____________________.

C-16 (CA Conjecture) – Corresponding Angles Conjecture - If two parallel lines are cut by a transversal, then ____

______________________. Conversely, if two lines are cut by a transversal forming pairs of corresponding angles equal in measure, then ____________________________________

C-17 (AIA Conjecture) Alternate Interior Angle Conjecture – If two parallel lines are cut by a transversal, then ____

____.

Conversely, if two lines are cut by a transversal __________________________________

____.

C-18 (AEA Conjecture) Alternate Exterior Angle Conjecture – If two parallel lines

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____.

Conversely, ____

____.

C-19 Isosceles Trapezoid Conjecture (Vertical Angles Conjecture) The base angles of an isosceles trapezoid are ____.

C-20 Triangle Midsegment Conjecture A midsegment of a triangle is ______________

to the third side and _____________________ the length of the _____________________.

C-21 Trapezoid Midsegment Conjecture – The midsegment of a trapezoid is ________________ to the bases and is equal in length to ____________________

____.

C-22 The ___________________________ of a parallelogram are ____________________

C-23 The ______________________________ of a parallelogram are _______________________.

C-24 The ___________________________ of a parallelogram are _____________ _____________________________-

C-25 The ____________________ of a parallelogram ___________________________

C-26 The ______________________ of a rhombus are _______________________

______________________ of each other.

C-27 The ________________ of rhombus ________________ the angles of the rhombus.

C-28 The measure of each angle of a rectangle is _______________.

C-29 The __________________ of a rectangle are __________________________.

C-30 (Coordinate Midpoint conjecture) - If (x_1, y_1) and (x_2, y_2) are the coordinates of the endpoints of a segment, then the coordinates of the midpoint are

C-31 Parallel Slope Conjecture - In a coordinate plane, two lines are ______________ if and only if their slopes are ____________________.

C-32 Perpendicular Slope Conjecture - In a coordinate plane, two lines are ________________ if and only if their slopes are _______________________

____.

Chapter 5

C-33 – SSS Congruence Conjecture – If the three sides of one triangle are congruent to the three sides of another triangle, then ______________________________________.

C-34 – SAS Congruence Conjecture – If two sides and the angle between them in one triangle are congruent to two sides and the angle between them in another triangle, then_______________________________________.

C-35 – ASA Congruence Conjecture – If two angles and the side between them in one triangle are congruent ____
____

C-36 - SAA Congruence Conjecture – If two angles and a side that is not between them in one triangle are congruent to the corresponding _______________________
____

C-37 – Vertex Angle Conjecture – In an isosceles triangle, the bisector of the vertex angle is also the ________________ to the base and the ______________ to the base.

Chapter 6

C – 38 If two chords in a circle are congruent, then they determine two central angles that are ____________________________.

C-39 – If two chords in a circle are congruent, then their __________________ are congruent.

C- 40 two congruent chords in a circle are ___________________ from the center of the circle.

C-41 The perpendicular bisector of a chord ________________________________.
C – 42 – (Tangent Conjecture) A tangent to a circle is perpendicular to the radius drawn to the point of tangency.

C – 43 – Tangent Segments Conjecture - Tangent segments to a circle from a point outside the circle are________________________.

C – 44 – Inscribed Angle Conjecture - The measure of an inscribed angle in a circle equals ____

C- 45 - Angles inscribed in the same arc are ___________________________

C- 46 – Every angle inscribed in a semicircle is a ________________________________

C- 47 – The __________________ angles of a quadrilateral inscribed in a circle are _______________________________

C- 48 – Parallel lines intercept ______________________ arcs on a circle.

C – 49 - Circumference Conjecture – If C is the circumference and D is the diameter of the circle, then there is a number π such that C = _______ Since D – 2*r* where *r* is the radius, then C = ________.

C – 50 – Arc Length Conjecture - The arc length equals the ____________________ ____ divided by _________, times ______________________________________

Chapter 7

C – 51 A regular polygon of *n* sides has _____ reflectional symmetries and ______ rotational symmetries.

C – 52 - The ________ and only _____ regular polygons that create pure tessellations are _________________________, ___________________________________, and _____________________________________.

C- 53 - ________________ triangle will create a pure tessellation.

C – 54 - _____________ quadrilateral will create a pure tessellation.

Chapter 8

C – 55 – Rectangle Area Conjecture – The area of a rectangle is given by the formula __________________ where *A* is the area, *b* is the length of the base, and *h* is the height of the rectangle.

C – 56 – Parallelogram Area Conjecture - The area of a parallelogram is given by the formula ____________ where *A* is the area, *b* is the length of the base, and *h* is the height of the parallelogram.

C – 57 – Triangle Area Conjecture – The area of a triangle is given by the formula ___________ where *A* is the area, *b* is the length of the base, and *h* is the height of the triangle.

C – 58 – Trapezoid Area Conjecture – The area of a trapezoid is given by the formula ______________________________ where *A* is the area, b_1 and b_2 are the lengths of the two bases, and *h* is the height of the trapezoid.

C – 59 – Regular Polygon Area Conjecture - The area of a regular polygon is given by the formula _________________________ where *A* is the area, *a* is the apothem, *s* is the length of each side, and *n* is the number of sides of the regular polygon. Since the length of each side times the number of sides is the perimeter (*sn* = *p)*. The formula can also be written as A – (1/2)a___

C – 60 – Circle Area Conjecture - The area of a circle is given by the formula _________________________ where *A* is the area and *r* is the radius of the circle.

Chapter 9

C – 61 – Pythagorean Theorem – In a right triangle, if *a* and *b* are lengths of the legs and *c* is the length of the hypotenuse, then _____________________________

C – 62 – Converse of Pythagorean Theorem - If the lengths of the three sides of a triangle work in the Pythagorean formula, then the triangle _____________________ __________________________.

C- 63 – If you multiply the lengths of all three sides of any right triangle by the same number the resulting triangle will be a ______________________________________.

C – 64 If the lengths of two sides of a right triangle have a common factor, then

____

C – 65 – Isosceles Right Triangle Conjecture – In an isosceles right triangle, if the legs have length *x*, then the hypotenuse has length __________________.

C – 66 30-60 Right Triangle Conjecture - In a 30-60 right triangle, if the shorter leg has length *x*, then the longer leg has length ___________________.

C – 67 – Distance Formula - If the coordinates of points A and B are (x_1, y_1) and (x_2, y_2) respectively, then AB^2 =

And AB =

C – 68 – The midpoint of the hypotenuse of a right triangle is _____________________
____

Chapter 10

C – 69 – Prism-Cylinder Volume Conjecture - If *B* is the area of the base of a prism or cylinder and *H* is the height of the solid, then the formula for the volume is V = _______

C – 70 – Pyramid-Cone Volume Conjecture – If *B* is the area of the base of a pyramid or cone and *H* is the height of the solid, then the formula for the volume is V =

C – 71 – Sphere Volume Conjecture - The volume of a sphere with radius *r* is given by the formula

Chapter 11

C – 72 SSS Similarity Conjecture - If the three sides of one triangle are proportional to the three sides of another triangle, then the two triangles are ___________________.

C – 73 – AA Similarity Conjecture – If _______ angles of one triangle are congruent to ________ angles of another triangle, then ____ ____________________

C – 74 – SAS Similarity Conjecture – If two sides of one triangle are proportional to two sides of another triangle and ____
In one triangle is congruent to the ____
In the other triangle, then the two triangles are similar.

C – 75 – Proportional Parts Conjecture – If two triangles are similar, then the corresponding ___________________, corresponding ________________, and corresponding _______________________ are ____________________ to the corresponding sides.

C – 76 – The angle bisector in a triangle divides the opposite side into two segments whose lengths are in the same ratio as _____________________________________.

C – 77 Proportional Area Conjecture - If two similar polygons (or circles) have corresponding sides (or radii) in the ratio of m/n, then their areas are in the ratio of _______ / _______.

C – 78 Proportional Volume Conjecture - If two similar solids have corresponding dimensions in the ratio of m/n, then their volumes are in the ration of _____ / ______.

C – 79 Parallel Proportionality Conjecture - If a line parallel to one side of a triangle passes through the other two sides, then it divides them _________________________. Conversely, if a line cuts two sides of a triangle proportionally, then it is _____________ to third side.

C- 80 If two or more lines pass through two sides of a triangle parallel to the third side, then they divide the two sides ____________________________.

Chapter 15

C – 81 – Intersecting Chords Conjecture – The measure of an angle formed by the intersection of two chords in a circle is equal to ______________________________
____

C – 82 – Intersecting Secants Conjecture – The measure of an angles formed by two secants intersecting outside a circle is equal to one-half the __________________ of the measures of the two intercepted arcs.

C – 83 – The diagonals of a trapezoid divide each other __________________________

C – 84 If two chords in a circle intersect, ____
____
____

C – 85 – If two secants intersect outside a circle, the product of the length of one secant segment and the length of its external part is equal to the product of ________________
____

C – 86 The altitude to the hypotenuse of a right triangle is the ____________________
_______________ to the segments on the hypotenuse.