Propositions of Geometry

Proposition I

One of the relative properties between straight lines and a perfect curve or circle is such, that all regular shapes formed of straight lines and equal sides, have their areas equal to half the circumference multiplied by the least radius which the shape contains (which is always the radius of an inscribed circle) than which every other radius contained in the shape is greater, and the circle has its area equal to half the circumference multiplied by the radius, to which every other radius contained in the circle is equal.

Proposition II

The circumference of any circle being given, if that circumference be brought into the form of a square, the area of that square is equal to the area of another circle, the circumscribed square of which is equal in area to the area of the circle whose circumference is first given.

Proposition III

The circle is the natural basis or beginning of all area, and the square being made so in mathematical science, is artificial and arbitrary.

Proposition IV

The circumference of any circle being given, if that circumference be brought into any other shape formed of straight lines and of equal sides and angles, the area of that shape is equal to the ((area of another circle, which circle being circumscribed by another and similar shape, the area of such shape circumscribing the last named circle is equal to the area of the circle whose circumference is given.

Proposition V

The circumference of a circle by the measure of which the circle and the square are made equal, and by which the properties of straight lines and curved lines are made equal, is a line outside of the circle, wholly circumscribing it, and thoroughly enclosing the whole area of the circle, and hence, whether it shall have breadth or not, forms no part of the circle.

Proposition VI

The circumference of a circle, such that its half being multiplied by radius, to which all other radii are equal, shall express the whole area of the circle, by the properties of straight lines, is greater in value in the sixth decimal place of figures than the same circumference in any polygon of 6144 sides, and greater also than the approximation of geometers at the same decimal place in any line of figures.

Proposition VII

Because the circle is the primary shape in nature, and hence the basis of area; and because the circle is measured by, and is equal to the square only in ratio of half its circumference by the radius, therefore, circumference and radius, and not the square of diameter, are the only natural and legitimate elements of area, by which all regular shapes are made equal to the square, and equal to the circle.

Proposition VIII

The equilateral triangle is the primary of all shapes in nature formed of straight lines, and of equal sides and angles, and it has the least radius, the least area, and the greatest circumference of any possible shape of equal sides and angles.

Proposition IX

The circle and the triangle are opposite to one another in all the elements of their construction, and hence the fractional diameter of one circle, which is equal to the diameter of one square, is in the opposite duplicate ratio to the diameter of an equilateral triangle whose area is one.

Proposition X

The fractional diameter of one circle which is equal to the diameter of one square being in the opposite ratio to the diameter of the equilateral triangle whose area is one, equals 81.

Proposition XI

The fractional area of one square which is equal to the area of one circle, equals, 6561; and the area of the circle inscribed in one square equals 5153.

Proposition XII

The true ratio of circumference to diameter of all circles, is four times the area of one circle inscribed in one square for the ratio of circumference, to the area of the circumscribed square for the ratio of diameter. And hence the true and primary ratio of circumference to diameter of all circles is 20612 parts of circumference to 6561 parts of diameter.

Proposition XIII

The line approximated by geometers as the circumference of a circle is a line coinciding with the greatest limit of the area of the circle, but not enclosing or containing it.

Proposition XIV

An infinity in minuteness is always such, that it is capable of increase; therefore, in material things, an infinity equals one ultimate particle of matter, such, that in the nature of the material or thing under consideration, it cannot be less.

Axioms as proven herein and self evident:

First: The circumference of a circle is a line outside of the circle thoroughly enclosing it, and of itself forms no part of the area of the circle. (Proposition V)

Second: The line approximated by geometers, if it could be correctly determined, is a line coinciding with the greatest limit of the area of the circle, but not enclosing it. (Proposition I)

Third: The line approximated by geometers is consequently the circumference of a circle whose diameter is less than one in its relative value to the area of a circle. (Proposition I, III, IV & XIII)

Fourth: The difference between a line coinciding with the greatest limit of the area of any circle and a line enclosing the same circle, is an infinity, such that it cannot be less.
(Proposition XIV)

Fifth: In material things an infinity equals one ultimate particle of whatever material or thing is under consideration, such that it cannot be less. (Proposition XIV)

Sixth: An infinity is a value, such that it is always capable of increase. (Proposition XIV)

Proposition XV

The value of the infinity which is the difference between the inscribed and circumscribed lines (axiom 4th), and which is omitted by geometers, is increased in the process of bisection of a circumference, so that at some great number of sides of a polygon it will always equal one or more in the sixth decimal place, and may be increased, until it shall equal circumference itself.

Axioms as proven herein and self evident::

First: Space is infinitely divisible. (Proposition XIV)

Second: Any imaginary line (not a material line), which shall have breadth, is equal to the same portion of space.

Third: Any such imaginary line is, therefore, infinitely divisible.

Fourth: Any such imaginary line may, therefore, be divided, until each part or division is less than any magnitude which is, or can be, developed to our senses.

Fifth: At whatever point the division of such a line may be arrested, because the sum of all parts is equal to the whole; therefore, each part must have breadth, though the breadth of each part may be such, that no conceivable number of them form a developed magnitude.

Sixth: One line cannot occupy two places at the same time; neither can two lines be in one and the same place, at the same time.

Seventh: Two lines without breadth, cannot exist with no breadth between them.

Eighth: The existence of shape signifies limit; hence, no shape can exist without a boundary line definitely located, which forms no part of the shape itself, which boundary is its circumference.

Proposition XVI

No two lines lying in the same plane, parallel to each other, and between two other straight lines, which are at an angle to each other, can possibly coincide, and be equal, except they shall become one and the same line.

Proposition XVII

All lines which have a fixed and definite locality must have breadth, whether they be lines of circumference, or lines of division.

Proposition XVIII

The circle inscribed and circumscribed about an equilateral triangle, is in duplicate ratio to the circle inscribed and circumscribed about a square.

Axioms as proven herein and self evident::

First: Circumference and radius (and not the square of diameter) are the only natural and legitimate elements of area by which all regular shapes may be measured.

Second: The equilateral triangle and the circle are exactly opposite to one another in the elements of their construction, which are circumference and radius. (Proposition VIII & IX)

Third: The equilateral triangle is the primary of all shapes in nature formed of straight lines and of equal sides and angles.

(Proposition III), and has the least number of sides of any shape in nature formed of straight lines, and the circle is the ultimatum of nature in the extension of the number of sides.

Proposition XIX

In all the elements of their construction which serve to increase or diminish area, the equilateral triangle and the circle are exactly opposite one another in respect to the greatest and the least of any shapes in nature, and hence they are opposite to one another in ratio of the squares of their diameters, or in duplicate ratio.

See Also

Algebraic Values of Trigonometric Functions
Arithmetic
Circle
Cube
Cubing the Sphere
Geometry
Proportion
Propositions of Astronomy
Quadrature of the Circle
Ratio
Square
Thirds