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The Circle is a Binary Polygon

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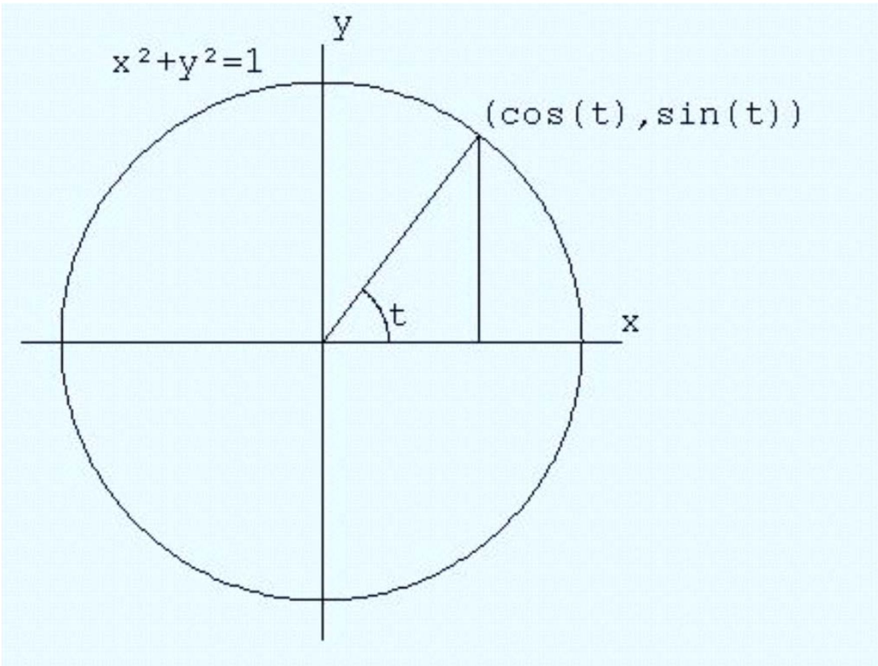
The Arc theory proves that the Circle is a binary Polygon and has 2^55 Sides engineered in Algebra and Geometry; truly a breakthrough in mathematics. The methods of Pythagoreas Right Triangle Theorem and Stagno Arc Theorem was used to construct the Arc length.

The maximum arc length is equal at π *r; the π is a constant of the circle and r is the radius.

Triangle Theory



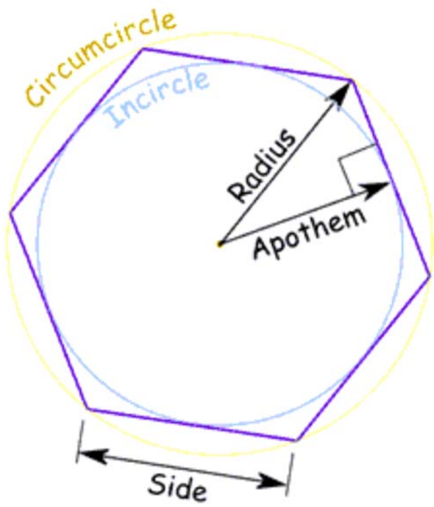
The above picture shows a circle centred with (x, y) axis at (0, 0) and defined by x^2 + y^2 = 1.

The layout tells us that the point cos (t), sin (t) is on the unit circle.

Moreover, this approch leads to a definition of cos (t) and sin (t) for all real (t).

t = Degrees varying from 90 ° to 0 °

Polygon Side



Geometrically the picture above define the Polygon Side function
The symbol is: "S" a straight line that links two points on a circle or a curve is called; Polygon Side or Side.

The Side angle is the length between two points on a circle separated by that angle.

It is easily related to the sine function by taking one of the points to be zero.

Side

S^2 = y^2 + (1–x)^2 S = [(1–x^2) + (1–x)^2]^(1/2)

S = (2–2x)^(1/2) = Side varying from 2^(1/2) to 0

Apothem

The distance from the center of a regular polygon to the midpoint of a Side.

(S/2)^2= (1-x)/2 Apothem^2=1-(1-x)/2

Apothem= [(1+x)/2] ^(1/2) Apothem varying from (1/2) ^(1/2) to 1

Stagno Theorem

Apothem^2 + (S/2)^2 = 1

Arc Theory

In drawing isosceles triangles on the circular sector, it has shown the area between the Arc and the Side; all the triangles are varying in size smaller near the arc until they cover the total area.

The small Arc length at this stage is equal at the small Side being best for completing the total length of the Arc; Therefore,

At this state the small Side is used to calculate the length of the Arc.

Sides

Expand the Binary Polygon Side to reach the arc length value in Radians.

From now on let expand the Side step by step to see the full expansion with the input at x = 0.

Let start with the first expansion

S1 = {[(1-Apothem)^2+(1-x)/2]^(1/2)}*2^1

S1 = {[2-(2+2x)^(1/2)]^(1/2)}*2^1; Therefore,

(2+2x)^(1/2) = Increment one = I1 the First Increment

Also

I1 = 2* Apothem= 2* [(1+x)/2] ^(1/2) = (2+2x)^(1/2)

I=Increment=(2+?)^(1/2) ? is the variable 2x

this equation is Stagno Incremental Theorem

First expansion is called Sides one = S1 and this Polygon has eight Sides.

S1 = [(2–I1) ^(1/2)] *2^1

This is the first expansion varying from 1.53 to 0

S1 has two Sides this equation is Stagno Sides Theorem

I2 is Second Increment = [2+ (2+2x) ^(1/2)] ^(1/2)

This Polygon has sixteen Sides

S2 = [(2-I2) ^(1/2)] *2^2 at Second expansion varying from 1.53 to 0 S2 has four Sides.

n is Last Increment = Last

Sn=[(2-In)^(1/2)]*2^n at Last expansion varying from **π/2 to 0**

Sn has infinite Sides.

The half-angle formula is sin(t/2)

S=2*sin(t/2) Arc length=2^54*sin(t/2^54)=pi/2 at 90 degree.

Expander is varying from 1 to 53 and is called n;

Therefore, [(2-In) ^ (1/2)] is equal at the small Side and at this stage is equal at the small Arc length

also

[(2-In) ^ (1/2)] = [(2-I53) ^(1/2)].

Full expanded Sides or Arc length is equal at

S53=[(2-I53) ^(1/2)]*2^53

this is the Stagno Arc Theorem.

Conclusion

In this article I have considered the theoretical and numerical value of the expanded Polygon Sides; The arc length now is proven and calculates with algebraic equations.

Sn = Arc length value in Radian the value of X can vary from 0 to 1
Full expanded Polygon Sides is
S53 = [(2-I53) ^(1/2)]*2^53 this is the Stagno Arc Theorem
Tell that the Circle is a binary Polygon and has 2^55 Sides.