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A GREAT MATHEMATICAL TRUTH : SQUARE ROOT TWO IS AN INVISIBLE PART & PACEL OF CIRCLE (118th Geometrical construction on Real Pi)

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ABSTRACT

Square root two was introduced by Pythagorean Hippasus of Metapontum representing the diagonal of the square. In March 1998, it was discovered that the same square root two, plays an important role in deciding the true value of Pi, too.

KEYWORDS: Circle, diameter, hypotenuse, square root two, triangle..

INTRODUCTION

Circle, square, triangle, regular polygon etc., are important geometrical entities. All entities except circle are straight-lined entities. These dimensions are easily measurable. Whereas, the dimensions of circle, for example, the length of the circumference of circle and the extent of area of the circle, are very very difficult to measure them accurately. Millions of mathematicians in the last many centuries have tried to get exact values for circumference and area of circle. Finally, they have come to the conclusion that π is 3.1415926… and circumference and area of circle can be calculated using formulae, $2\pi r$ and πr^2, where π is 3.1415926… and 'r' is radius, of the circle.

Surprisingly, 3.145926… as π, **was disproved** by the discovery of 3.1464466… and the latter number to be exact, is $\frac{14-\sqrt{2}}{4}$, in March 1998, by this author, a non-mathematician to the core. In the next eighteen years, 117 geometrical methods have confirmed that π no doubt equal to 3.1464466… is correct, and 3.1415926… is an approximation only from its 3rd decimal place on wards. It is a shocking news to this author also.

Main opposition to the new value $\frac{14-\sqrt{2}}{4}$, by the mathematics community is that the significant role of square root two, $\sqrt{2}$ in circle. Any amount of proofs in the last 18 years, as geometrical constructions, **have failed to convince the mathematics community.**

This author, however has been consistently arguing and submitting one by one every time with a new method, that $\frac{14-\sqrt{2}}{4}$ is the **true Pi value**.

Here is the latest **experimental evidence,** for the first time, that square root two, $\sqrt{2}$, is part and parcel of the circle, and how exactly, $\sqrt{2}$ is involved in deriving $\frac{14-\sqrt{2}}{4}$ which was obtained by other 117 earlier methods.

Procedure: Draw a circle and inscribe a triangle.

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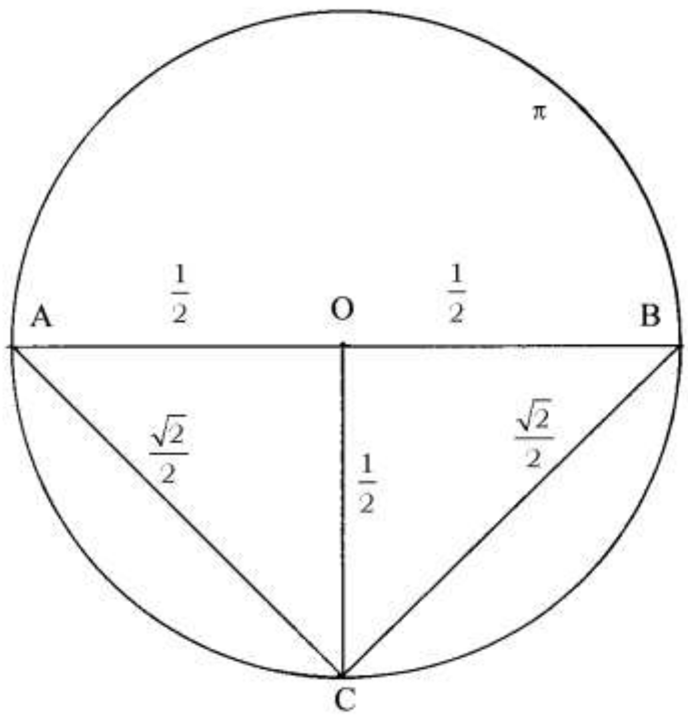

Fig-1

AB = diameter = 1
Circumference = π

$$4\pi + \sqrt{2} = 14$$

AB = Diameter = d = 1

Radius = AO = OB = OC = $\frac{1}{2}$

Triangle ABC
AB = 1

OC = $\frac{1}{2}$

AC = CB = $\frac{\sqrt{2}}{2}$

Circumference = π

The length of the circumference is not known and is represented by π.

$$\pi d = \pi \times 1 = \pi$$

This author's study of circle and square from 1972 has given the opportunity to him to see **two great mathematical truths,** at two spells, one, on March 1998 (in the derivation of Pi value using radius of the circle only) and the 2nd truth, on December, 2015 in the form of the following equation.

$$4\pi d + \sqrt{2}d = 14d$$

then $$\pi = \frac{14d - \sqrt{2}d}{4d} = \frac{14 - \sqrt{2}}{4}$$

Explanation of the equation $4\pi d + \sqrt{2}d = 14d$

πd represents the length of the circumference, and 14d represents the sum of 14 diameters of the same circle. This author is happy that he could explain the involvement of $\sqrt{2}d$ here (the square root 2 of the diameter). The equation thus, says that four circumferences **plus** the square root 2 of the diameter is **equal** to the sum of the 14 diameters of same circle. However, **it does require a proof for this statement.** He has only an experimental proof for it. It is like saying an impossible thing (associating $\sqrt{2}$ with circle) as that "Sun rises in the **west**". This may be untrue, but the association of square root 2 with circle is **not an impossible concept** and is, as true as "Sun rises in the East". How ? This author requests the readers to follow him carefully of this experiment done at home with the help of improvised materials.

EXPERIMENTAL PROCEDURE

1. *Take a round cap and measure its diameter (better its diameter minimum 4 cms)*
2. *Mark 14 diameters length on a table or on the edge of a cot (14 d) = FH of Fig.2.*
3. *Turn the cap (looks like hollow cylinder) on the above 14d length,* ***4 times.*** *Mark the end point of 4^{th} completed turn (G in Fig.2)*
4. *Some length (distance) remains uncovered by the cap after 4 turns. Measure its length (Fig.2 GH)*
5. *Add step 3 and step 4.*
   Length of 4 turns + uncovered distance is equal to 14d.

OR

1. *Take the above cap of 4 cms diameter and fold around it, a ribbon of paper 2 cms width* ***one round*** *only (πd) exactly. Cut the piece. Measure its length on the straight edge.*
2. *Multiply 4 times of Step.1 which gives $4\pi d$.*
3. *With pocket calculator find out $\sqrt{2}$ value of the* ***diameter*** *of the cap ($\sqrt{2}d$)*
4. *Add Step 2 and Step 3, which will be equal to 14 diameters of the circle (i.e. cap)*

With minor experimental errors we can prove that $4\pi d + \sqrt{2}d = 14d$

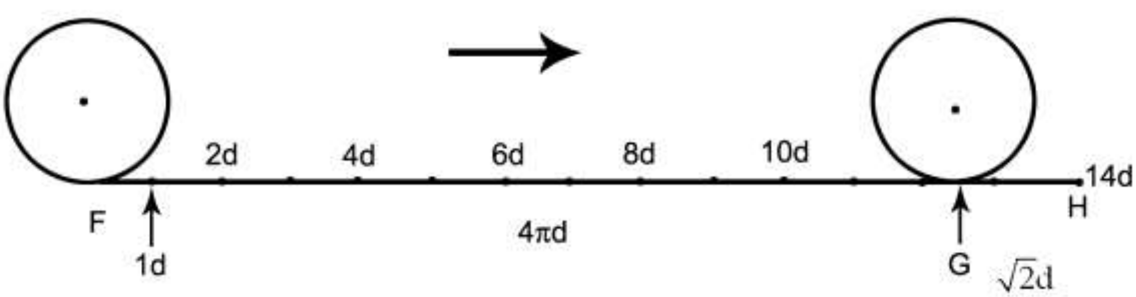

Fig-2: Experimental truth for $4\pi d + \sqrt{2}d = 14d$

(FG) + (GH) = (FH)

FH length = 14 diameters (14 d)
FG length = 4 turns of circle ($4\pi d$)
GH length = FH – FG = 14d – $4\pi d$ = $\sqrt{2}d$

The above experiment proves that the remaining length after 4 turns ($4\pi d$) of (wheel/ cap) the circle on a 14d length, is equal to $\sqrt{2}d$.

CONCLUSION

The square root two is part and parcel of the circle in its invisible form.

Dedication

This paper is humbly dedicated to Pyathagorean **Hippasus of Metapontum,** Greece, who has discovered $\sqrt{2}$ for the diagonal of the square.

Author

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