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Unequivocally Expressing PI as a Fraction

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Abstract
(9 PAGES of MATHEMATICAL EXCITEMENT)

The precise value of PI shall from this day forth be expressed as the fraction $\frac{9\sqrt{2}}{4}$ and shall be known to show a repeating pattern as a continued fraction. The digits are not randomly distributed, and does not express any statistical randomness. This shall be proven through solving the ancient challenge of squaring the circle(s) with only a straightedge.

Keywords: PI, fraction, repeating pattern, straightedge, continued fraction

1: Introduction

Throughout the ages, many have tried to approximate the value of PI through exhaustive methods only to fall short of an easier and more accurate method. Even until recently, not much was known about PI and many questions remained unanswered. The solution in part was realized when watching Tadashi Tokieda demonstrate that four circles equates to a square in the video located on YouTube @ (https://youtu.be/wKV0GYvR2X8). Even Tadashi overlooked the significance of a square being folded into four circles, as it appears he only thought of the **circles to square** as a trick and did not realize the monumental implication of going from a square to four circles. It is with great pleasure that I thank **Tadashi Tokieda**, **Brady Haran**, **Mathematical Sciences Research Institute** and **Numberphile** for providing me with a simple demonstrable solution. What makes this particular solution different from squaring a single circle is that **four circles**, with their powers combined; equal a square.

2: Definition

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1. **The area of a square is equal to circumference of 4 circles**

1.1. **$S^{2=}4Ci$**

1.1.1. S = Single side of square

1.1.2. Ci = Circumference of single circle

1.2. This differs from squaring the circle because it is not 1:1 it is **1:4**

2. Defining Squares:

2.1.1. Divide square at midpoint (horizontal line)

2.1.1.1. Define as S_0

2.1.2. Divide S_0 at midpoint (vertical line)

2.1.2.1. Define as S_1

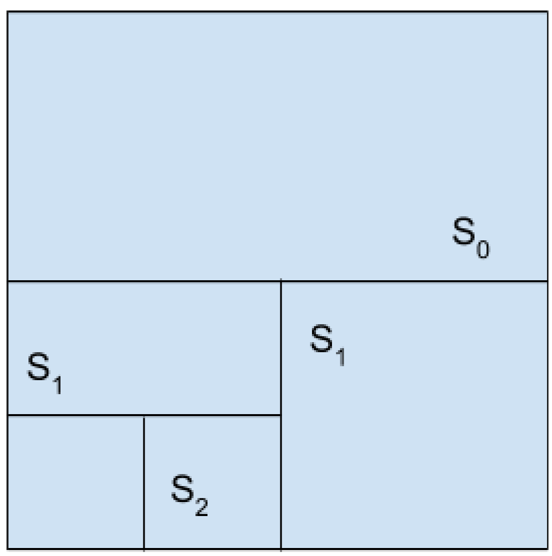
2.1.2.1.1. S_1(vertical line) $\equiv$ S_1(horizontal line)

2.1.3. Divide S_1 at midpoint (horizontal line)

2.1.3.1. Define as S_2

2.1.4. S_1 equals diameter of **ONE** circle

2.1.5. S_2 equals radius of **ONE** circle

2.1.6. 

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2.2. Defining Triangles:

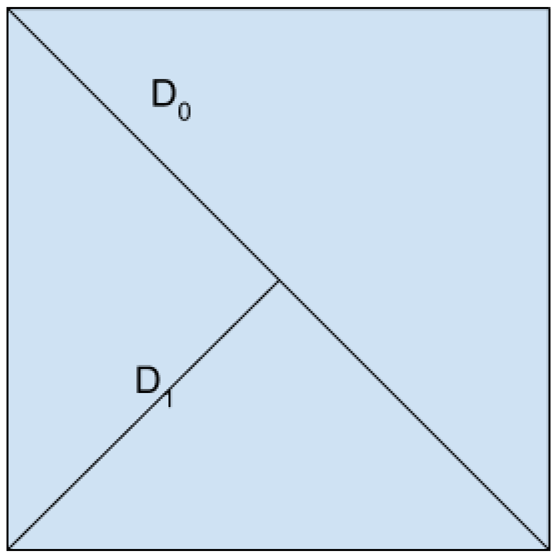
2.2.1. Divide square at opposite endpoints (diagonal line)

2.2.1.1. Define as D_0

2.2.2. Divide D_0 at midpoint (diagonal line)

2.2.2.1. Define as D_1

2.3. D_1 equals EXACT value of π

2.3.1. 

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3. Proof:

3.1. Let S = **n**>+0

3.1.1. where **n** is greater than **positive zero**

3.2. Let S_0 = S

3.3. Let $S_1 = S_0 / 2$

3.4. Let $S_2 = S_1 / 2$

3.5. Let $D_0 = S_0\sqrt{2}$

3.5.1. NOTE: unlike pythagorean theorem, we want the non-square-rooted value

3.5.2. we are using the calculation $\mathbf{a^2+b^2=D}$

3.5.3. NOT

3.5.4. $a^2+b^2=c^2$

3.5.5. **WHERE $\mathbf{c^2 \equiv D}$ AND $\mathbf{a \equiv b}$**

3.6. Let $D_1 = (\frac{S_0\sqrt{2}}{2})$

3.7. D_1 divides D_0 at the midpoint thus D_1 equals D_0 divided by 2

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4. Calculation

4.1. Let S = 9

4.1.1. (**3**^{2} is the LCL ((Least Common Length for {$a^2 + b^2 = c^2$})))

4.1.1.1. Where C^2 is an integer, **not a fraction**

4.2. Let $S_0 = S = 9$

4.3. Let $S_1 = \frac{9}{2} = 4.5$

4.4. Let $S_2 = \frac{4.5}{2} = 2.25$

4.5. Let $S_3 = \frac{2.25}{2} = 1.125$

4.6. Let $D_0 = \frac{1}{2} * 9\sqrt{2} = \frac{9\sqrt{2}}{2}$

4.6.1. D_0 Decimal approximation:
6.363961030678927719607599258943641353563523439196266329295...

4.7. Let $D_1 = \frac{1}{2} * \frac{9\sqrt{2}}{2} = \frac{9\sqrt{2}}{4}$

4.7.1. D_1 Decimal approximation:
3.181980515339463859803799629471820676781761719598133164647...

4.7.2. Continued Fraction:

Linear form

$$3+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{50+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{50+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{50+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

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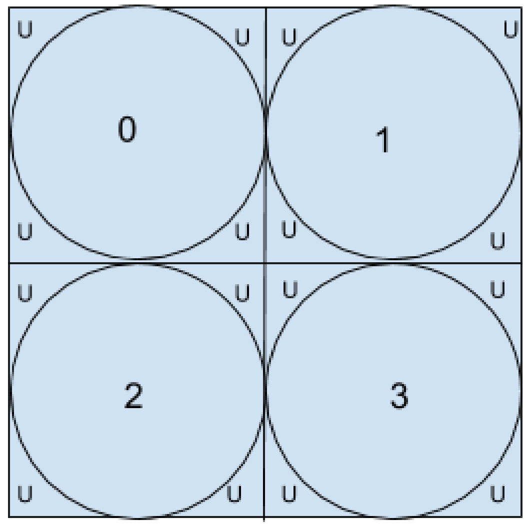
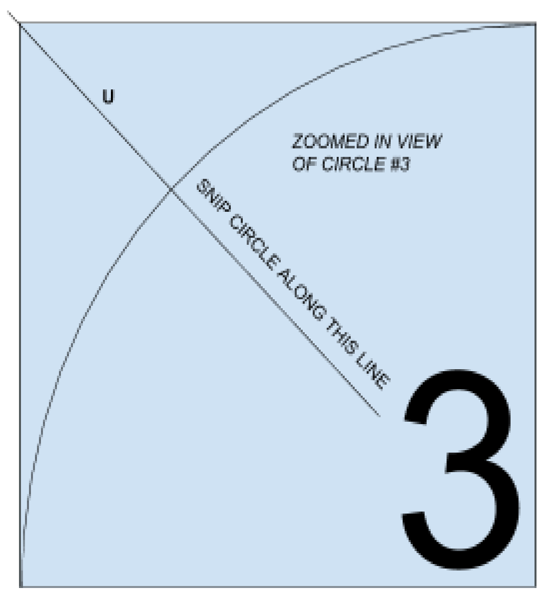
4.7.3. Why this works???

4.7.3.1. For unknown value U: $\frac{U * 16}{4}$ = a line



4.7.3.2.



4.7.3.3. Or for another simplified way of understanding this solution:

- 4.7.3.3.1. Define circle with a single snip as **"STRING"**
- 4.7.3.3.2. Snip each circle ONCE at the point closest to the midpoint of the square
- 4.7.3.3.3. Push the uncut **"STRING"** against the perimeter of the square

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4.8. S=9;

4.8.1. ACTUAL VALUE OF PI= $\frac{9\sqrt{2}}{4}$

4.8.2. $\sqrt{9^2+9^2} - (\frac{9\sqrt{2}}{4} * \mathbf{4})=0$

4.8.2.1. **4**=(NUMBER OF CIRCLES to 1 SQUARE $_{1.4}$)

4.8.2.2. $-(\frac{4*9\sqrt{2}}{4}) = 4^{1-1}(9\sqrt{2})(-1)$

4.8.2.3. $\sqrt{9^2+9^2} - 4^{1-1}(9\sqrt{2})$

4.8.2.3.1. 1-1=0

4.8.2.4. $\sqrt{9^2+9^2} - 4^0(9\sqrt{2})$

4.8.2.4.1. $4^0 = 1$

4.8.2.5. $\sqrt{9^2+9^2} - 1(9\sqrt{2})$

4.8.2.5.1. $9^2 = 81$

4.8.2.6. $\sqrt{81+9^2} - (9\sqrt{2})$

4.8.2.6.1. $9^2 = 81$

4.8.2.7. $\sqrt{81+81} - (9\sqrt{2})$

4.8.2.7.1. $81+81 = 162$

4.8.2.8. $\sqrt{162} - (9\sqrt{2})$

4.8.2.8.1. $\sqrt{162} = \sqrt{2*3^4} = 3^2\sqrt{2})$

4.8.2.9. $(3^2\sqrt{2}) - (9\sqrt{2})$

4.8.2.9.1. $3^2 = 9$

4.8.2.10. $(9\sqrt{2}) - (9\sqrt{2}) = 0$

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4.9. S=9;

4.9.1. JUNK_PI= 3.1415926535897932384626433832795028841971693993751058

4.9.2. $\sqrt{9^2+9^2}-(JUNK\_PI*4)\neq 0$

4.9.2.1. $\sqrt{9^2+9^2}-4*JUNK\_PI$

4.9.2.2. $\sqrt{81+9^2}-4*JUNK\_PI$

4.9.2.2.1. $9^2=81$

4.9.2.3. $\sqrt{81+81}-4*JUNK\_PI$

4.9.2.3.1. $81+81=162$

4.9.2.4. $\sqrt{162}-4*JUNK\_PI$

4.9.2.4.1. $\sqrt{162}=\sqrt{2*3^4}=3^2\sqrt{2})$

4.9.2.5. $(3^2\sqrt{2})$ - $-4*JUNK\_PI$

4.9.2.5.1. $3^2=9$

4.9.2.6. $(9\sqrt{2})-4*JUNK\_PI\ =$

4.9.2.6.1. Decimal approximation: 0.16155144699868248536462498476927117033836928089

4.9.2.7. $(9\sqrt{2})$ -JUNK_PI = **.04**

4.9.2.8. 0.16155144699868248536462498476927117033836928089/**.04 = 4.0387861749670621341156246192317792584592 32**

4.9.2.8.1. TRUNCATE the values behind 4.0... because of the inaccuracy of JUNK_PI

4.9.2.8.2. the difference is a factor of **4**

4.9.2.8.2.1. (NUMBER OF CIRCLES to 1 SQUARE $_{1.4}$)

3: Conclusion

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If you are annoyed with this new **PRECISE** value and would like a

simple way refute this new value of PI:

1. Method 1: Find a value of **W** that does not equal **156**.
    a. **Ever wonder why the Colosseum isn't a circle???**
        - **a.** Length = 189 meters
        - **b.** Width = 156 meters

    ii. W ≢ L (W not identical to L)
        1. Let L = 189 meters **(Desired diameter of circle)**
        2. We shall now solve for **W**.
            a. Using simplified values of PI for ease in calculation:
                i. piNEW = 3.18$_{(4.7.1)}$
                ii. piOLD = 3.14

    iii. ((((piNEW)L)-((piOLD)L))-(((piNEW)**W**)-((piOLD)**W**)))===((L-**W**)*(piNEW-piOLD))
        1. Simplifies to:
            a. (7.56-(0.04**W**))===((0.04)*(189-**W**))
                i. Solve for **W**!!!!!
                    1. OR
                ii. Let **W=156**
2. Method 2: Endless walk:
    1. Measure out 1265 meters of string to use as a radius.
    2. Measure out 1265 meters * (3.14+junk) of string to lay as the circumference.
    3. Go out into a large flat field.
    4. Put a stake in the ground that is able to rotate freely about its axis.
    5. Connect the 1265 meter radius string to the rotating axis of the stake.
    6. With the least amount of slack humanly possible walk about the circumference laying down the circumference string with as much precision as humanly possible.
    7. If you are able to complete the circle without being roughly 90+ meters short, the $\frac{9\sqrt{2}}{4}$ value is wrong and I am willing to admit my error.

In the end, I do apologize to:

1. those who have wasted time memorizing an inaccurate value
2. those who have waisted computer time calculating an inaccurate value
   AND
3. those who will have wasted time and effort walking 5 + (a bit) miles in a circle expecting to walk only 4.94 miles.

Please watch and subscribe to Numberphile on YouTube and support the sponsors who help to make Numberphile possible!! Until then, thank you for taking the time to read this!!GS

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