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FORMULAS FOR THE NUMBER PI

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THEOREM

$$\sum_{n=1}^{\infty} \left[\frac{8 n}{(4 n-3)(4 n-2)(4 n-1)} \right] = \frac{\pi}{4} + \ln(2)$$

$$\sum_{n=1}^{\infty} \left[\frac{8 n - 4}{(4 n-3)(4 n-2)(4 n-1)} \right] = \frac{\pi}{4}$$

DEMONSTRATION

I will first show the second and then made the first
Each term can be divided into the following parts

+ (1/(4*n-3) - 1/(4*n-2)) + (1/(4*n-2) - 1/(4*n-1))

The first is equal to adding

((4*n-2) - (4*n-3))/((4*n-2)*(4*n-3))

Which equals

1/((4*n-3)*(4*n-2))

The second is equal to adding

((4*n-1) - (4*n-2)/((4*n-2)*(4*n-1))

Which equals

1/((4*n-2)*(4*n-1))

If the two join totaling

1/((4*n-3)*(4*n-2)) + 1/((4*n-2)*(4*n-1)) =

((4*n-1) + (4*n-3))/((4*n-3)*(4*n-2)*(4*n-1)) =

(8*n-4)/((4*n-3)*(4*n-2)*(4*n-1))

Therefore the formula

$$\sum_{n=1}^{\infty} \left[\frac{8*n - 4}{(4*n-3)*(4*n-2)*(4*n-1)} \right]$$

Is equal to the succes numbers

+(1/1 - 1/2) +(1/2 - 1/3)

+(1/5 - 1/6) +(1/6 - 1/7)

+(1/9 - 1/10) +(1/10 - 1/11)

+(1/13 - 1/14) +(1/14 - 1/15)

Fractions with denominator couple cancel each other
And the remainder is equal to

+ 1/1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + 1/13 - 1/15 +...

Which equals PI/4

Therefore the formula

$$\sum_{n=1}^{\infty} \left[\frac{8*n - 4}{(4*n-3)*(4*n-2)*(4*n-1)} \right]$$

Equals PI/4

DEMONSTRATION OF THE FIRST FORMULA

In a previous message demonstrate formula

$$\text{SUMA}_{n=1}^{\infty} \left[\frac{16*n - 6}{(4*n-3)*(4*n-2)*(4*n-1)*(4*n)} \right] =$$

PI/4 - LN(2)/2

There is a well-known formula for the number pi E. H. Clarke

$$\sum_{n=1}^{\infty} \left[\frac{1}{(4n-3)(4n-2)(4n-1)(4n)} \right] =$$

LN(2)/4 - PI/24

Demonstrate that the formula in a previous message can be
Write as

$$\sum_{n=1}^{\infty} \left[\frac{16n}{(4n-3)(4n-2)(4n-1)(4n)} - \frac{6}{(4n-3)(4n-2)(4n-1)(4n)} \right] =$$

PI/4 - LN(2)/2

The sum of the terms of the second adding equals

$$\sum_{n=1}^{\infty} \left[\frac{6}{(4n-3)(4n-2)(4n-1)(4n)} \right]$$

That is equal to the formula E. H. Clarke multiplied by 6
Or (3 * LN (2))/2 - PI/4

Thus the sum of the terms of adding first

$$\sum_{n=1}^{\infty} \left[\frac{16n}{(4n-3)(4n-2)(4n-1)(4n)} \right]$$

Can be written as

$$\sum_{n=1}^{\infty} \left[\frac{4}{(4n-3)(4n-2)(4n-1)} \right]$$

Is equal to the total amount made the most of E. H. Clarke
Multiplied by 6

PI/4 - LN(2)/2 + (3 * LN(2)/2 - PI/4) = LN(2)

Therefore the numbers succes

4/(1*2*3) + 4/(5*6*7) + 4/(9*10*11) + 4/(13*14*15) + 4/(17*18*19) +...

Equals LN(2)

The formula to demonstrate that principle can be written as

$$\sum_{n=1}^{\infty} \left[\frac{8*n}{(4*n-3)*(4*n-2)*(4*n-1)} - \frac{4}{(4*n-3)*(4*n-2)*(4*n-1)} \right] = \mathrm{PI}/4$$

The sum of the terms of the second adding

$$\sum_{n=1}^{\infty} \left[\frac{4}{(4*n-3)*(4*n-2)*(4*n-1)} \right]$$

Is equal to the succession of numbers that we have seen for
The logarithm(2)

Thus the sum of the terms of adding first
Is equal to the overall result more LN(2)

$\mathrm{PI}/4 + \mathrm{LN}(2)$

$$\sum_{n=1}^{\infty} \left[\frac{8*n}{(4*n-3)*(4*n-2)*(4*n-1)} \right] = \mathrm{PI}/4 + \mathrm{LN}(2)$$