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Barak Shoshany ⚡

@BarakShoshany

So it turns out you can write $\pi/4$ as le produit of all odd prime numbers, each one divided by the multiple of 4 nearest to it:

$$\pi/4 = 3/4 \times 5/4 \times 7/8 \times 11/12 \times 13/12 \times 17/16 \times 19/20 \times 23/24 \times \dots$$

What kind of sorcery is this??

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Marcus van der Erve ⚡ @MarcusErve · 18h

Replying to @BarakShoshany

How would one prove this?

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Joshua Z @JoshuaZed1 · 17h

Replying to @MarcusErve and @BarakShoshany

See section 4.4 for the proof here [maths.nottingham.ac.uk/plp/pmzcw/down...](https://maths.nottingham.ac.uk/plp/pmzcw/download...)

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Olaf Willocx @olafwillocx · 18h

Replying to @BarakShoshany

Dirichlet character magic

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Joshua Z @JoshuaZed1 · 17h

Replying to @BarakShoshany

This is arising from the DirichletL function for the non-principal character mod 4, and then connecting that to arctan. See section 4.4 from [maths.nottingham.ac.uk/plp/pmzcw/down...](https://maths.nottingham.ac.uk/plp/pmzcw/download...)

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Joshua Z @JoshuaZed1 · 17h

Replying to @JoshuaZed1 and @BarakShoshany

Also note that if you've seen a proof that Pi is irrational, this also gives you then a very heavy handed proof that there are infinitely many primes (since otherwise this produit would be finite and rational).

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Barak Shoshany ⚡

@BarakShoshany

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BrockU physics professor (he/him). Research: time & causality, FTL/time travel, scientific computing. Atheist, composer, gamemaster, punslinger, skeptic, vegan.

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https://twitter.com/BarakShoshany/status/1581710946443018240

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(1) Barak Shoshany ⚡ on Twitter: "So it turns out you can write $\pi/4$ as the product of all odd prime numbers, each one divided b..."

Marco Piani @Marco_Piani · 17h

Replying to @BarakShoshany

cc: @VictimOfMaths

1

Colin Angus @VictimOfMaths · 17h

Replying to @Marco_Piani and @BarakShoshany

I refuse to believe this could be true.

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Show replies

Seamus Blackley ✓ @SeamusBlackley · 17h

Replying to @BarakShoshany

Pi and infinite series are spookily related. It's very very deep.

#Contact

6

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Steve Wart @swartable · 17h

Replying to @SeamusBlackley and @BarakShoshany

I do not like this. I wanted to see how fast it would converge but after testing the first 998 odd primes I found the minimum error was 7.90364e-06 after 742 terms, but after 998 primes the error goes up to 0.001156. I'm afraid the graph forms a pentagram.

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