

Foias constant

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In mathematical analysis, the Foias constant, is a number named after Ciprian Foias.

If

x

1

>
0
 and

$$x_{n+1}=\left(1+\frac{1}{x_n}\right)^n\text{ for }n=1,2,3,\ldots,$$

then the Foias constant is the unique real number

α
 such that if

x

1

=
α
 then the sequence diverges to

∞
.^[1] Numerically, it is

$$\alpha = 1.187452351126501\dots \text{ A085848[?] }$$

No closed form is known.

When

x

1

=
α
 then we have the limit:

$$\lim_{n\rightarrow\infty}x_n\frac{\log n}{n}=1,$$

where “log” denotes the usual natural logarithm.

A fortuitous observation between the prime number theorem and this constant goes as follows,

$$\lim_{n\rightarrow\infty}\frac{x_n}{\pi(n)}=1,$$

where

π
 is the prime-counting function.^[2]

See also

- Mathematical constant

Notes and references

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