The Number e

Charles Keyser

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Working Document (my pdf)

The "constant" e (Wikipedia)

I can't believe this association hasn't been made sometime in the 18th century, but I haven't seen it in my readings, so just in case:

Consider the invariant numbers $n = n\left(\frac{n}{n}\right) = n\left(1_n\right) \in \{o\}$ and

$n+1 = (n+1)\left(\frac{n+1}{n+1}\right) = (n+1)\left(1_{(n+1)}\right) \in \{e\}$ where n is odd so that $n+1$ is even.

Then $\varepsilon := \frac{n+1}{n} = \frac{n}{n} + \frac{1}{n} = \left(1_n + \frac{1}{n}\right)$ so that $\varepsilon_n := \varepsilon(n) = \left(1_n + \frac{1}{n}\right)^n$ which can be calculated via the Binomial Expansion for any odd number n where $n = \log_n(\varepsilon^n)$, and finally

$e_n := \lim_{n\to\infty}(\varepsilon_n) = \lim_{n\to\infty}\left(1_n + \frac{1}{n}\right)^n$.

Obviously $e(n)$ is not a prime number, but is a ratio that expresses the convergence of odd and even numbers $n \cong n+1$ for large n.