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MADHAVA SERIES:

$$\arctan(x) = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \dots$$

let $x=1$: $\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots$

If we use n terms of the series,
we get $m = \log_{10}(n)$ correct digits of π .

Suppose we want $m=8$ digits:

$$10^8 = \log_{10}(n)$$

We need: $10^8 = n$ terms

Set $x = \frac{1}{5}$: $\arctan\left(\frac{1}{5}\right) = \frac{1}{5} - \frac{1}{3}\left(\frac{1}{5}\right)^3 + \frac{1}{5}\left(\frac{1}{5}\right)^5 - \frac{1}{7}\left(\frac{1}{5}\right)^7 + \dots$

$$\arctan\left(\frac{1}{239}\right) = \frac{1}{239} - \frac{1}{3}\left(\frac{1}{239}\right)^3 + \frac{1}{5}\left(\frac{1}{239}\right)^5 - \frac{1}{7}\left(\frac{1}{239}\right)^7 + \dots$$