SCAN A5148

Dan Shanks

& my notes

3 pages

1 sequence

A5148

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Dear Sloane

Long time since we corresponded. I don't suppose you can identify the 1, 47, 2488, ... enclosed — or can you?

Ciao

Daniel Shanks

Dr DANIEL SHANKS

A5148

A series for π that converges 79 decimals per term.

Let $D = \frac{1}{2}(1071 + 184\sqrt{34})$, $d = D + \sqrt{D^2-1}$,
$E = \frac{1}{2}(1553 + 266\sqrt{34})$, $e = E + \sqrt{E^2-1}$,
$F = 429 + 304\sqrt{2}$, $f = F + \sqrt{F^2-1}$,
$G = \frac{1}{2}(627 + 442\sqrt{2})$, $g = G + \sqrt{G^2-1}$,

$U = (2defg)^{-6}$.

$$\pi = \frac{1}{\sqrt{3502}}\left[\log\frac{1}{U} + 24\left(U - \frac{47}{2}U^2 + \frac{2488}{3}U^3 - \frac{138799}{4}U^4 + \frac{7976456}{5}U^5 - \frac{467232200}{6}U^6 + \cdots\right)\right]$$

The coefficients a_n for $(-1)^{n+1}\frac{a_n}{n}U^n$ are computable by recursion but are not known in closed form. The terms shown above are correct to over 500 decimals.

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5148

$a_1 = 1$

$a_2 = 47$

$a_3 = 2488$

$a_4 = 138799$

$a_n = \frac{1}{24}\%$ x^n in $\prod_{k=1}^{\infty} (1+x^{2k-1})^{24n}$

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Ep 12

pp 255-389