

Harvesting scheme

Example



Guillera, Jesús. "Bilateral sums related to Ramanujan-like series." *arXiv preprint arXiv:1610.04839* (2016).

455,050  articles

(a) **scraping**

Below, we show how to solve the problem for the Ramanujan-type series for $1/\pi$. Consider, for example the Ramanujan series

$$(21) \quad \sum_{n=0}^{\infty} (-1)^n \frac{(\frac{1}{2})_n (\frac{1}{4})_n (\frac{3}{4})_n}{(1)_n^3} \frac{21460n + 1123}{882^{2n}} = \frac{3528}{\pi}.$$

278,242,506  equations

(b) **retrieval**

`"\sum_{n = 0}^{\infty} (-1)^n \frac{(\frac{1}{2})_n (\frac{1}{4})_n (\frac{3}{4})_n}{(1)_n^3} \frac{21460n + 1123}{882^{2n}} = \frac{3528}{\pi}."`

121,662  equations

computes π ?

True

(c) **series or
continued
fraction?**

series

1656  equations

(d) **extract**

```
term: (-1)**n * RisingFactorial(1/2, n) * RisingFactorial(1/4, n)
* RisingFactorial(3/4, n) / (RisingFactorial(1, n)**3) * (21460*n + 1123) / 882**(2*n)
start: 0
variable: n
```

660  formulas

(e) **validate
via PSLQ**

$1122.99727845641348 == 3528 / \pi$

385  formulas

(f) **to recurrence**

$$\begin{aligned} & (-14681/1695923712 - (1946417*n)/89035994880 - (1366829*n^2)/66776996160 - (46871*n^3)/5564749680 \\ & \quad - n^4/777924)*f[n] + (-71386776899/8479618560 - (1836628904911*n)/89035994880 \\ & \quad - (1222951171699*n^2)/66776996160 - (39244403773*n^3)/5564749680 - (777923*n^4)/777924)*f[1 + n] \\ & \quad + (45166/5365 + (110669*n)/5365 + (196509*n^2)/10730 + (151343*n^3)/21460 + n^4)*f[2 + n] = 0 \end{aligned}$$

385  formulas