

16.10-78

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Dear professor Madhava Rao,

my respects to you.

I am sending you a few samples of my work which I will dedicate for your 80th birthday. I will send the preprint in a few days. I will meet you in a few days in your home.

$$1) \frac{1}{\pi} = \sum_{n=1}^{\infty} n(2n-1)^{-2} \left(\frac{1 \cdot 3 \cdot \dots \cdot 2n-1}{2 \cdot 4 \cdot \dots \cdot 2n} \right)^2$$

$$2) \frac{2}{\pi^2} = \sum_{n=1}^{\infty} n(4n-1)(2n-1)^{-3} \left(\frac{1 \cdot 3 \cdot 5 \cdot \dots \cdot 2n-1}{2 \cdot 4 \cdot 6 \cdot \dots \cdot 2n} \right)^4$$

$$3) \frac{4}{\pi^3} = \sum_{n=1}^{\infty} f(n)(2n-1)^{-4} \left(\frac{1 \cdot 3 \cdot 5 \cdot \dots \cdot 2n-1}{2 \cdot 4 \cdot 6 \cdot \dots \cdot 2n} \right)^6$$

where $f(n)$ is a polynomial in n of degree 5 with integral coefficients.

I have an expression for $\left(\frac{2}{\pi}\right)^k$ involving $\left(\frac{1 \cdot 3 \cdot \dots \cdot 2n-1}{2 \cdot 4 \cdot \dots \cdot 2n}\right)^{2k}$

for arbitrary k . I have very good ones in hypergeometric functions. All these have their origin in my school work whose interests and interests before I joined TIFR. But recently I discovered that some of them can be put in an astonishingly general set up.

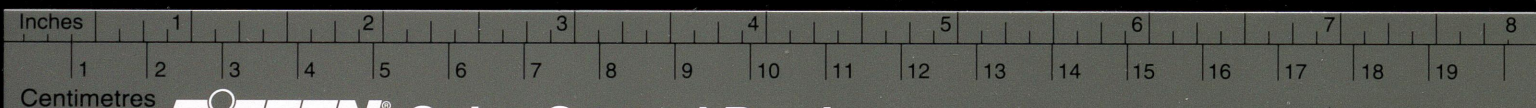
With best regards,

Yours sincerely
K. Ramanujan

Ramanujan

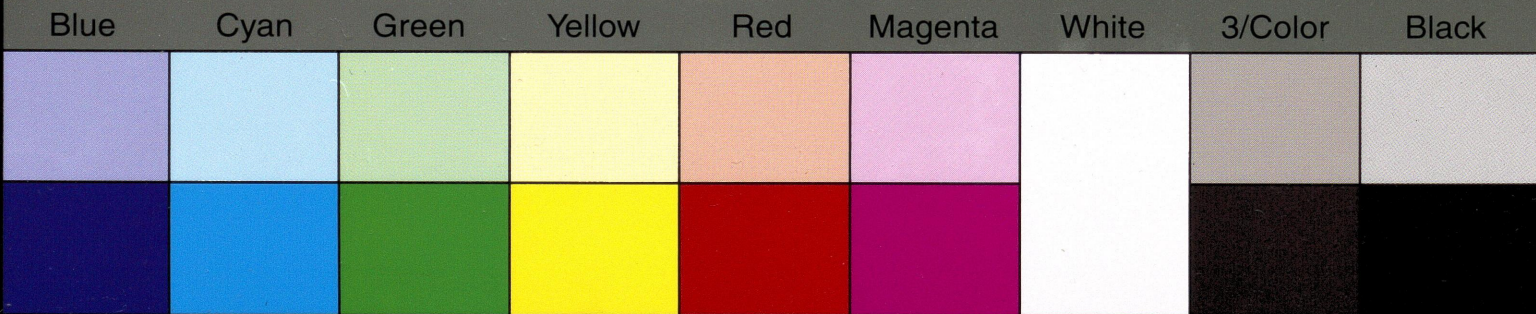
$$\frac{2}{\pi} = 1 - 5\left(\frac{1}{2}\right)^3 + 9\left(\frac{1 \cdot 3}{2 \cdot 4}\right)^3 - 13\left(\frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6}\right)^3 + 17\left(\frac{\dots}{\dots}\right)^3 - \dots$$

$$\frac{2\sqrt{3}}{\pi} = 1 - 9\left(\frac{1}{4}\right)^3 + 17\left(\frac{1 \cdot 5}{4 \cdot 8}\right)^3 - 25\left(\frac{1 \cdot 5 \cdot 9}{4 \cdot 8 \cdot 12}\right)^3 + 33\left(\frac{\dots}{\dots}\right)^3 - 41\left(\frac{\dots}{\dots}\right)^3 + \dots$$



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