Title: Mathematical Physics (PHYS 624) - Lecture 8

Date: Nov 25, 2009 09:00 AM

URL: http://pirsa.org/09110102

Abstract:

perimeter scholars

international

a_n: $(a_0 = 1)$ a_1 a_2 a_3 . . . . . .

$$1 \quad 5 \quad 61 \quad (2n)!$$

$$a_n: \quad (a_0 = 1) \quad a_1 \quad a_2 \quad a_3 \quad \cdots\cdots$$

1385

1 5 61 ? $(2n)!$

a_n: $(a_0=1)$ a_1 a_2 a_3 $\cdots$

1385

1 5 61 ? (2n)!

a_n: ($a_0=1$) a_1 a_2 a_3 ......

n^2

b_n: ($b_0=1$) b_1 b_2 b_3 ......

1385

1 5 61 ? $(2n)!$

a_n: $(a_0=1)$ a_1 a_2 a_3 .....

n^2

b_n: $(b_0=1)$ b_1 b_2 b_3 .....

I. $a_n = \int_{-L}^{L} W(x)\, x^{2n}\, dx \quad \left(\int_{-L}^{L} W(x)\,dx = 1 \right)$

1385

1 5 61 ? $(2n)!$

a_n: $(a_0=1)$ a_1 a_2 a_3 .....

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b_n : $(b_0=1)$ b_1 b_2 b_3 .....

I. $a_n = \int_{-L}^{L} W(x)\, x^{2n}\, dx \quad \left(\int_{-L}^{L} W(x)\,dx = 1 \right)$

II. $P_0(x) \equiv 1 \qquad P_1(x) = x$

1385

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$P_{n+1}(x) = x\, P_n(x) - b_n\, P_{n-1}(x)$

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(monic poly.)

1385

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$$P_2(x) = x^2 - b_1$$

$$P_3(x) = x^3 - b_1 x - b_2 x$$

1 3 8 5

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even

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n^2

b_n : $(b_0=1)$ b_1 b_2 b_3 - - - - -

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$$P_2(x) = x^2 - b_1$$

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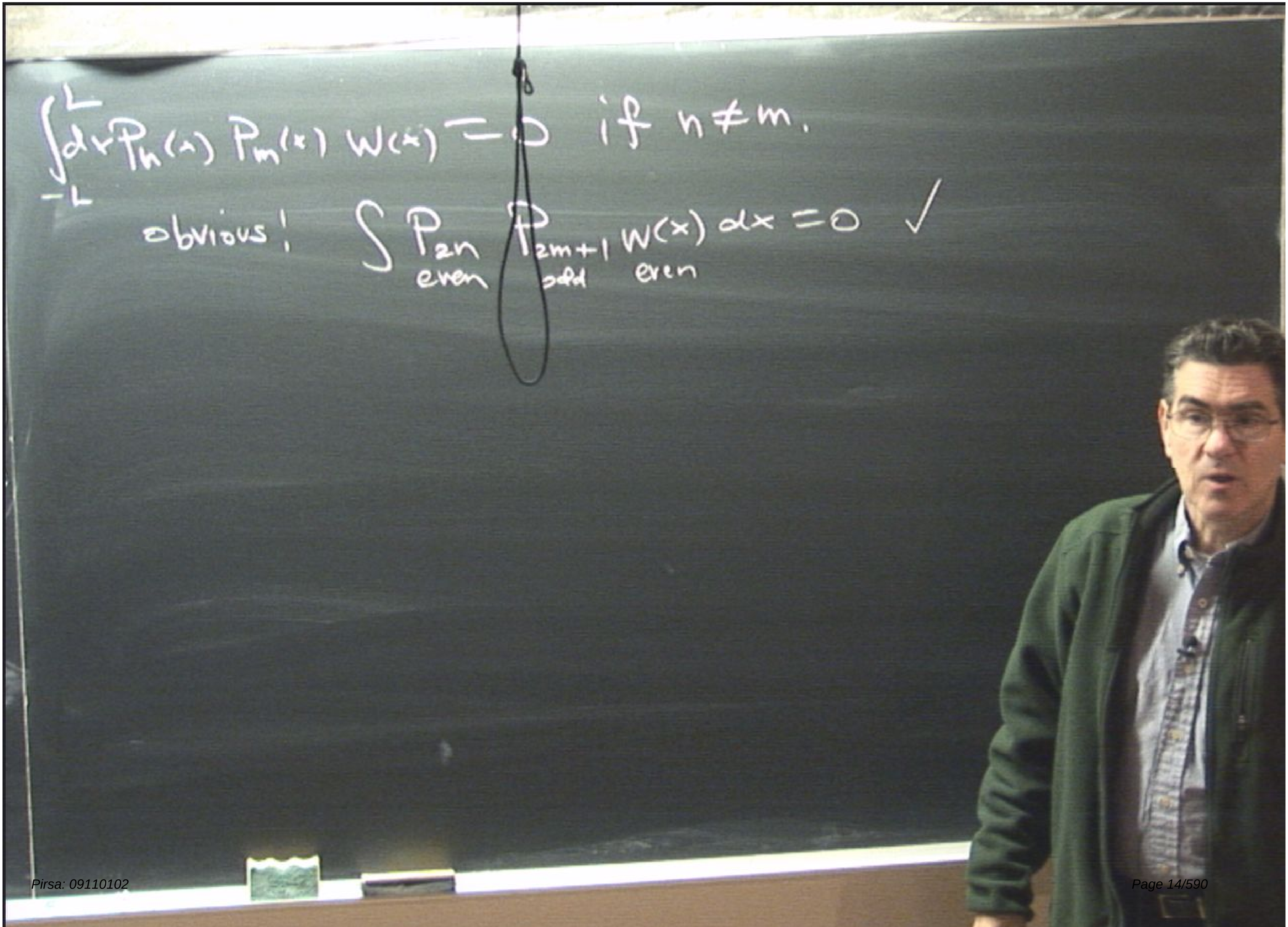
III. Demand $\{P_n\}$ is orthog w.r.t. $W(x)$


$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0$ if $n \neq m$.
obvious! $\int P_{2n}\, P_{2m+1}\, W(x)\, dx = 0$ ✓
even odd even

$$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0 \quad \text{if } n \neq m.$$

obvious! $\int_{-L}^{L} \underset{\text{even}}{P_{2n}}\ \underset{\text{odd}}{P_{2m+1}}\ \underset{\text{even}}{W(x)}\, dx = 0$ ✓

$P_0 \perp P_2$

$P_2 \perp P_4$

$P_0 \perp P_4$

$P_1 \perp P_3$

$P_1 \perp P_5$

$\vdots$

$$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0 \quad \text{if } n \neq m.$$

obvious! $\int_{-L}^{L} \underset{\text{even}}{P_{2n}}\ \underset{\text{odd}}{P_{2m+1}}\ \underset{\text{even}}{W(x)}\, dx = 0$ ✓

$$\left.\begin{array}{l} P_0 \perp P_2 \\ P_2 \perp P_4 \\ P_0 \perp P_4 \\ P_1 \perp P_3 \\ P_1 \perp P_5 \\ \vdots \end{array}\right\}$$

uniquely determine reln between a's + b's.

$$a_1 = b_1$$

$$a_2 = b_1(b_1 + b_2)$$

$$a_3 = b_1 b_2 b_3 + b_1(b_1 + b_2)^2$$

$$\vdots$$

$$\sum_{0}^{\infty} a_n x^n$$

$$\cfrac{b_0}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-\cfrac{b_3 x}{1-b_4 x \ddots}}}}$$

$$\sum_{0}^{\infty} a_n x^n$$

$$\cfrac{b_0}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-\cfrac{b_3 x}{1-b_4 x \ddots}}}}$$

b_0

$$\sum_{0}^{\infty} a_n x^n$$

$$\cfrac{b_0}{1 - \cfrac{b_1 x}{1 - \cfrac{b_2 x}{1 - \cfrac{b_3 x}{1 - b_4 x \cdots}}}}$$

$$b_0, \quad \frac{b_0}{1-b_1 x}, \quad \cfrac{b_0}{1-\cfrac{b_1 x}{1-b_2 x}}, \quad \cdots$$

$$\sum_{0}^{\infty} a_n x^n$$

$$S_N = \sum_{0}^{N} a_n x^n$$

$$S_0, S_1, S_2, \cdots \to L$$

$$\cfrac{b_0}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-\cfrac{b_3 x}{1-b_4 x \cdots}}}}$$

$$b_0,\ \frac{b_0}{1-b_1 x},\ \cfrac{b_0}{1-\cfrac{b_1 x}{1-b_2 x}},\ \cdots \to L$$

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Wall

$$\cfrac{b_0}{1 - \cfrac{b_1 x}{1 - \cfrac{b_2 x}{1 - \cfrac{b_3 x}{1 - b_4 x \cdots}}}}$$

$$b_0, \quad \frac{b_0}{1 - b_1 x}, \quad \cfrac{b_0}{1 - \cfrac{b_1 x}{1 - b_2 x}}, \quad \cdots \to L$$

$$\sum_{0}^{\infty} a_n x^n$$

$$1 + a_1 x + a_2 x^2 + \cdots$$

$$S_N = \sum_{0}^{N} a_n x^n$$

$$S_0, S_1, S_2, \cdots \to L$$

$$a_0 = b_0 = 1$$

$$a_1 = b_1$$

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Wall

$$b_0, \quad \frac{b_0}{1 - b_1 x}, \quad \cfrac{b_0}{1 - \cfrac{b_1 x}{1 - b_2 x}}, \quad \cdots \to L$$

$$b_0 = b_0(1 + b_1 x + \cdots)$$

$$\boxed{1 + b_1 x + \cdots}$$

$$\sum_{0}^{\infty} a_n x^n$$

$$1 + a_1 x + a_2 x^2 + \cdots$$

$$S_N = \sum_{0}^{N} a_n x^n$$

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$$b_0, \quad \frac{b_0}{1 - b_1 x}, \quad \cfrac{1}{1 - \cfrac{b_1 x}{1 - b_2 x}}, \quad \cdots \to L$$

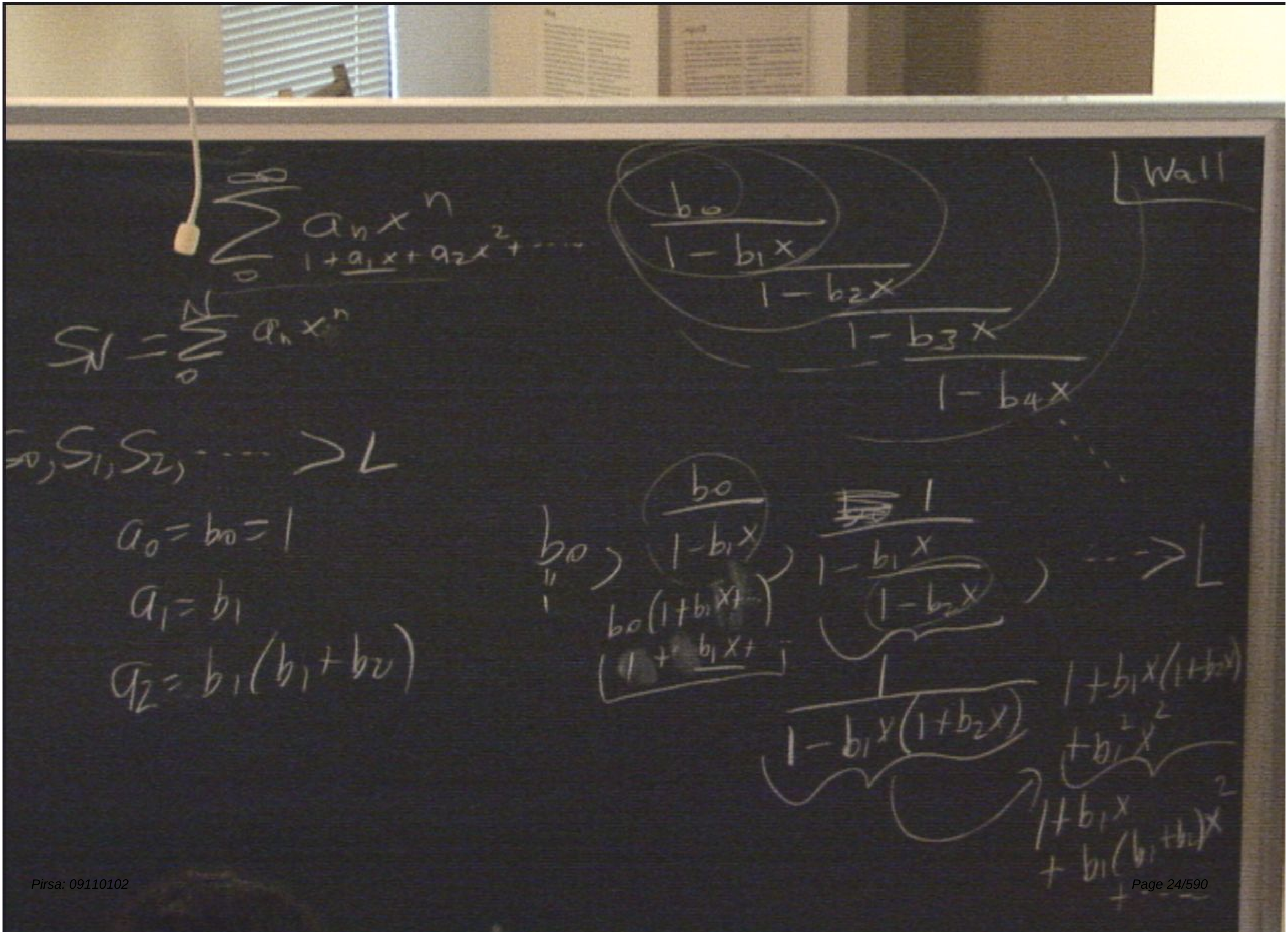
$$b_0 = b_0(1 + b_1 x + \cdots)$$

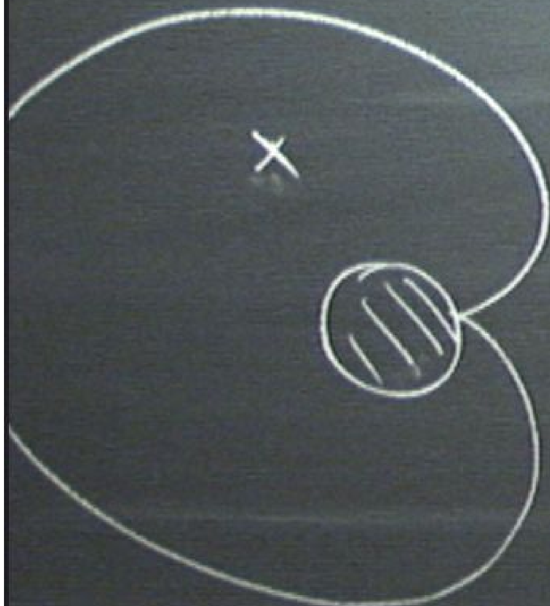
$$1 + b_1 x + \cdots$$

$$\frac{1}{1 - b_1 x (1 + b_2 x)}$$

$$1 + b_1 x (1 + b_2 x) + b_1^2 x^2$$

$$1 + b_1 x + b_1 (b_1 + b_2) x^2 + \cdots$$


Wall
$\sum_0^\infty a_n x^n$
$1 + a_1 x + a_2 x^2 + \cdots$
$S_N = \sum_0^N a_n x^n$
$S_0, S_1, S_2, \cdots \to L$
$a_0 = b_0 = 1$
$a_1 = b_1$
$a_2 = b_1(b_1 + b_2)$
$\cfrac{b_0}{1 - \cfrac{b_1 x}{1 - \cfrac{b_2 x}{1 - \cfrac{b_3 x}{1 - b_4 x}}}}$
$b_0, \quad \frac{b_0}{1 - b_1 x}, \quad \cfrac{1}{1 - \cfrac{b_1 x}{1 - b_2 x}}, \quad \cdots \to L$
$b_0(1 + b_1 x + \cdots)$
$1 + b_1 x + \cdots$
$\frac{1}{1 - b_1 x(1 + b_2 x)}$
$1 + b_1 x(1 + b_2 x) + b_1^2 x^2$
$1 + b_1 x + b_1(b_1 + b_2) x^2 + \cdots$



1385

1   5   61   ?   (2n

a_n: $(a_0=1)$ a_1 a_2 a_3 . . . . .

b_n: $(b_0=1)$ b_1 b_2 b_3 - - - - -

I. $a_n = \int_{-L}^{L} W(x)\, x^{2n}\, dx$ $\left(\int_{-L}^{L} W(x)\, dx = 1 \right.$

ev

II. $P_0(x) \equiv 1$ $P_1(x) = x$

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(monic poly.)

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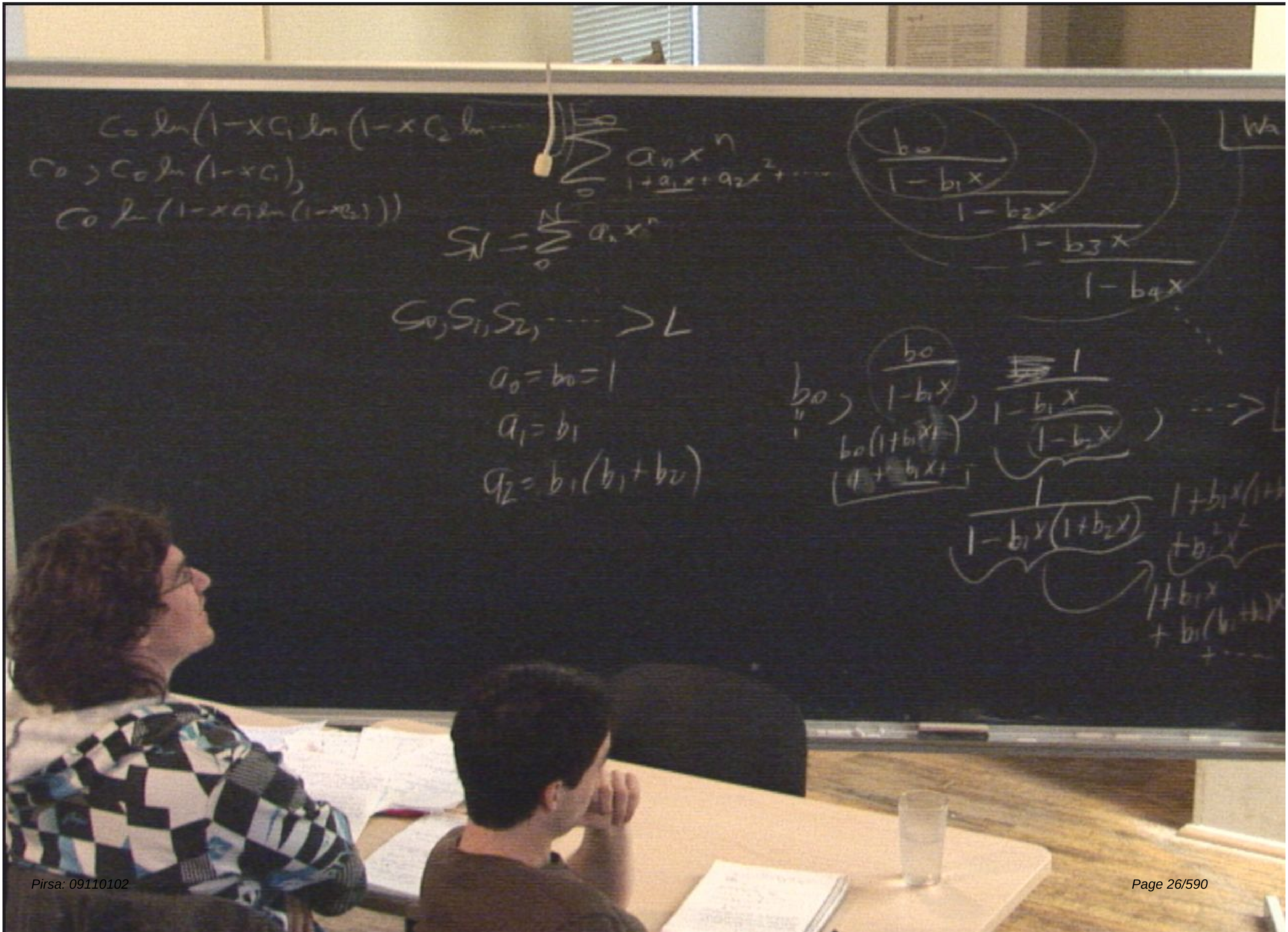
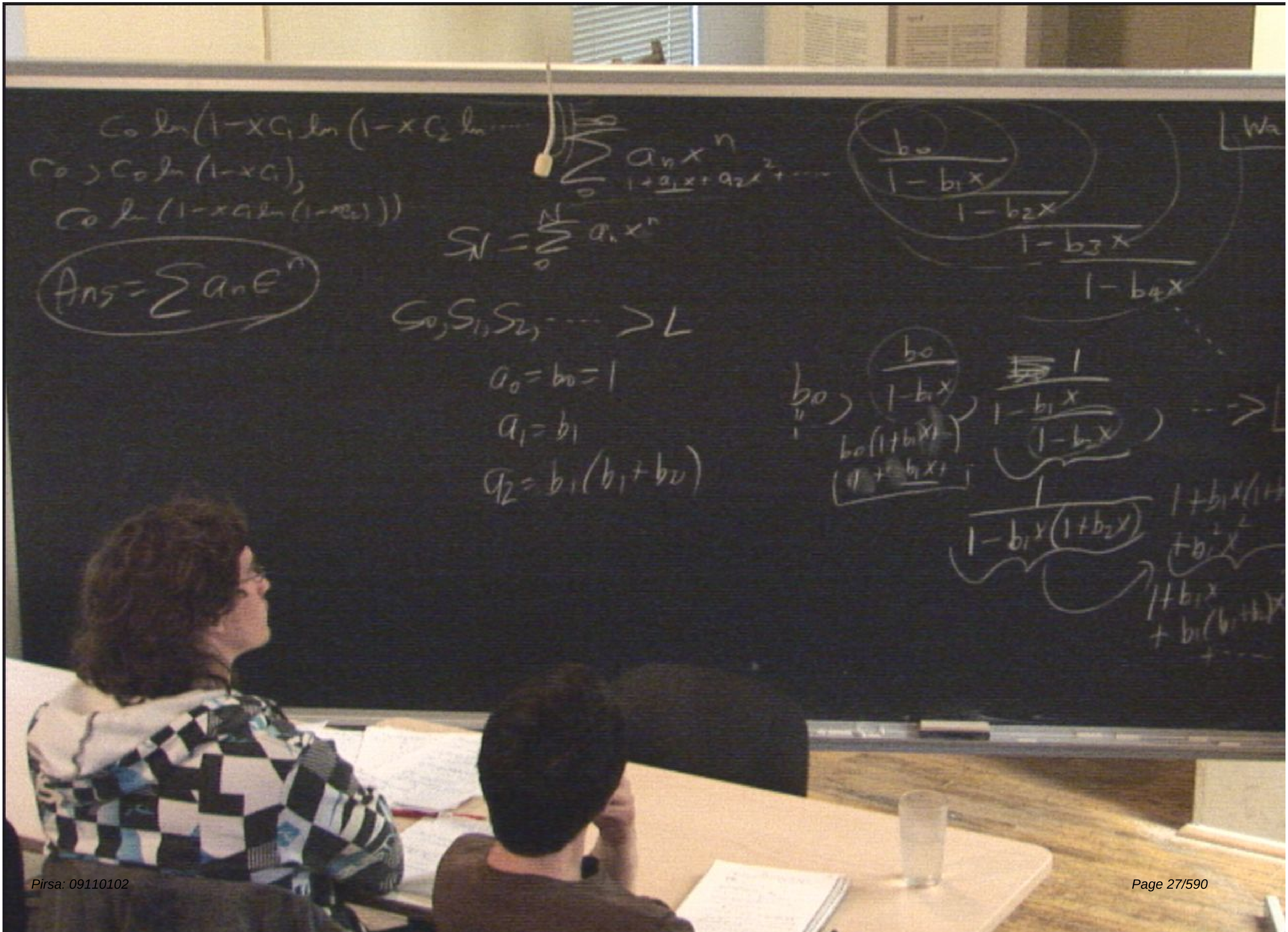

c0 ln(1 − x c1 ln(1 − x c2 ln ……
c0, c0 ln(1 − x c1),
c0 ln(1 − x c1 ln(1 − x c2)))
Σ an x^n
1 + a1 x + a2 x^2 + ……
SN = Σ an x^n
S0, S1, S2, …… → L
a0 = b0 = 1
a1 = b1
a2 = b1(b1 + b2)
b0
1 − b1 x
1 − b2 x
1 − b3 x
1 − b4 x
b0, b0 / (1 − b1 x), 1 / (1 − b1 x / (1 − b2 x)), ··· → L
b0(1 + b1 x + …)
1 / (1 − b1 x (1 + b2 x))
1 + b1 x(1 + b2 x)
+ b1^2 x^2
1 + b1 x
+ b1(b1 + b2) x^2
+ ……


$c_0 \ln(1 - x c_1 \ln(1 - x c_2 \ln \cdots$
$c_0, c_0 \ln(1 - x c_1),$
$c_0 \ln(1 - x c_1 \ln(1 - x c_2)))$
$Ans = \sum a_n \epsilon^n$
$\sum_0 a_n x^n$
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$$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0 \quad \text{if } n \neq m.$$

obvious! $\displaystyle\int_{-L}^{L} \underbrace{P_{2n}}_{\text{even}} \, \underbrace{P_{2m+1}}_{\text{odd}} \, \underbrace{W(x)}_{\text{even}} \, dx = 0$ ✓

$$\left.\begin{array}{l} P_0 \perp P_2 \\ P_2 \perp P_4 \\ P_0 \perp P_4 \\ P_1 \perp P_3 \\ P_1 \perp P_5 \\ \quad\vdots \end{array}\right\}$$

uniquely determine reln between a's + b's.

$$\boxed{a_1 = b_1}$$

$$a_2 = b_1(b_1 + b_2)$$

$$a_3 = b_1 b_2 b_3 + b_1(b_1 + b_2)^2$$

$$\vdots$$

$$HP \xrightarrow{\epsilon} HP(\epsilon) \to \text{Ans} = \sum a_n \epsilon^n \to C \to A \ \text{at } \epsilon = 1$$

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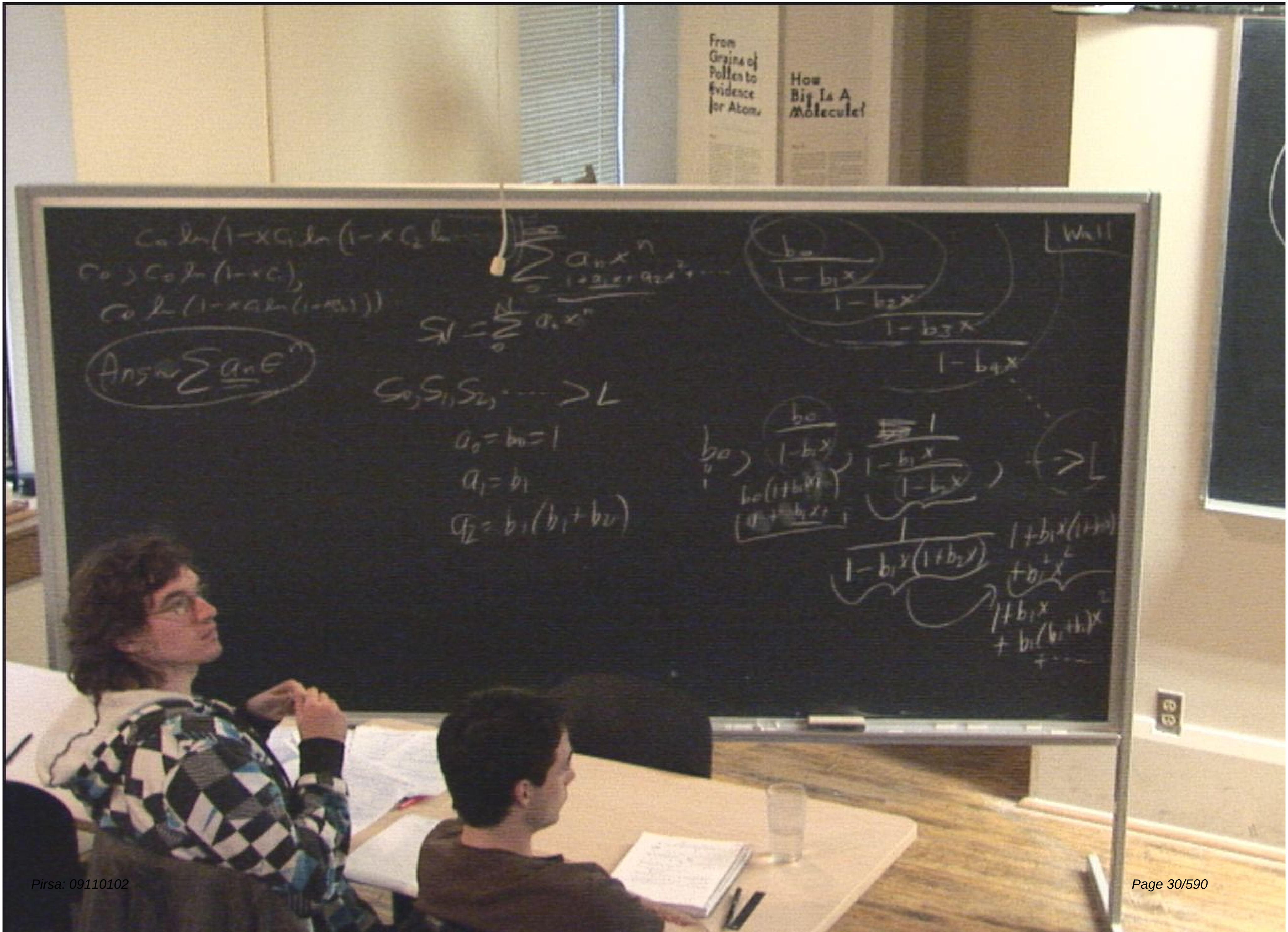
HP $\xrightarrow{\epsilon}$ HP(ϵ) $\rightarrow$ $\text{Ans} = \sum a_n \epsilon^n$ $\rightarrow$ CF $\rightarrow$ A at $\epsilon = 1$



From Grains of Pollen to Evidence for Atoms
How Big Is A Molecule?
Wall

$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}} \Rightarrow 1,\ \frac{1}{1-b_1 x},\ \cfrac{1}{1-\cfrac{b_1 x}{1-b_2 x}},\ \cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x}}},\ \ldots$$

$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}} \;\Rightarrow\; 1,\ \frac{1}{1-b_1 x},\ \cfrac{1}{1-\cfrac{b_1 x}{1-b_2 x}},\ \cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x}}},\ \ldots$$

$$\downarrow$$

$$1,\ \frac{1}{1-b_1 x},\ \frac{1-b_2 x}{1-b_1 x-b_2 x},\ \ldots$$

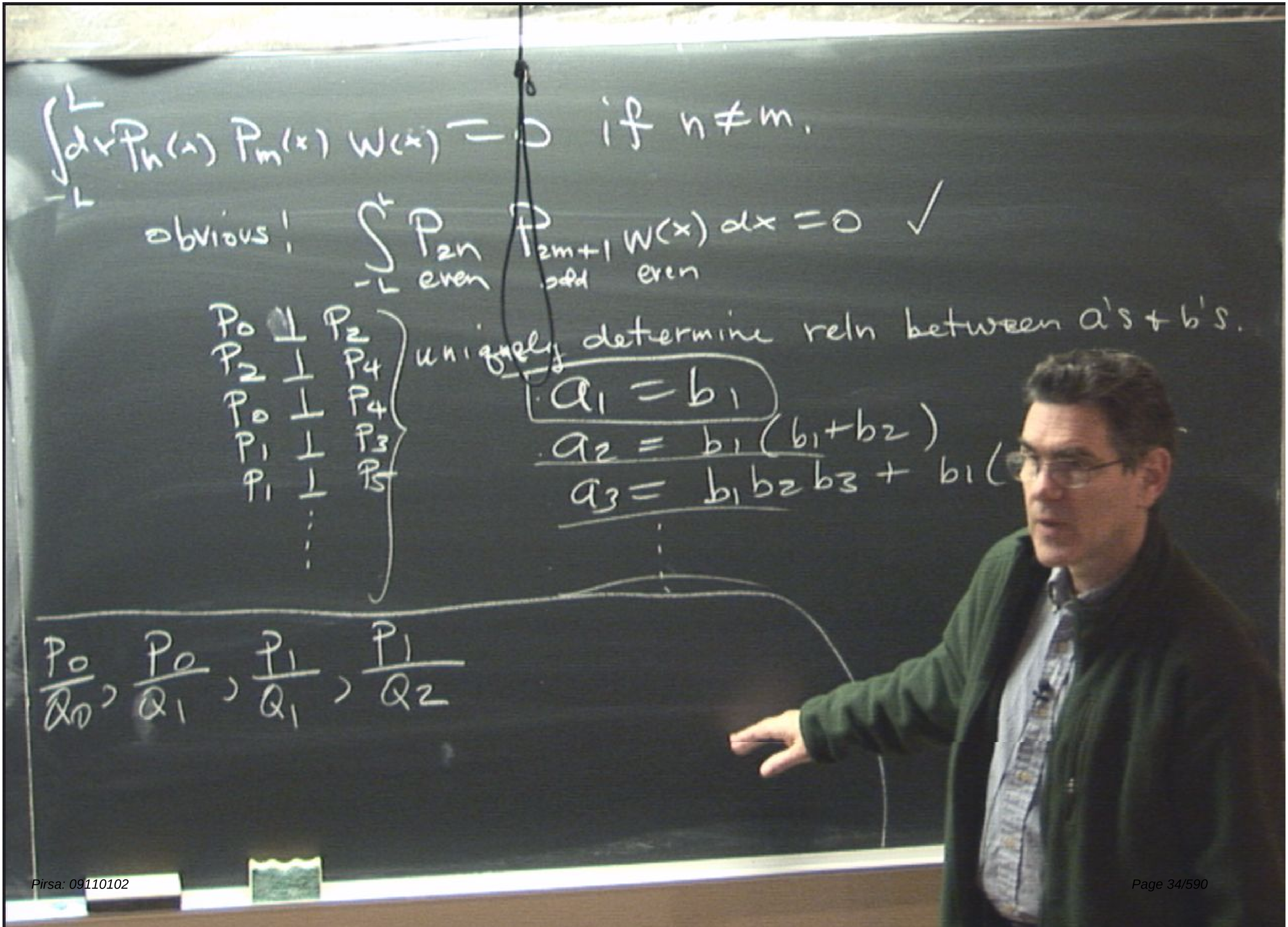
$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}} \rightarrow 1,\ \frac{1}{1-b_1 x},\ \cfrac{1}{1-\cfrac{b_1 x}{1-b_2 x}},\ \left(\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x}}}\right), \ldots$$

$$\downarrow$$

$$1,\ \frac{1}{1-b_1 x},\ \frac{1-b_2 x}{1-b_1 x-b_2 x},$$

$$\rightarrow \cfrac{1}{1-\cfrac{b_1 x(1-b_3 x)}{1-b_3 x-b_2 x}}$$

$$\rightarrow \frac{1-b_3 x-b_2 x}{1-b_3 x-b_2 x-b_1 x(1-b_3 x)}$$


∫_{-L}^{L} dx P_n(x) P_m(x) W(x) = 0 if n ≠ m.
obvious! ∫_{-L}^{L} P_{2n} P_{2m+1} W(x) dx = 0 ✓
even odd even
P_0 ⊥ P_2
P_2 ⊥ P_4
P_0 ⊥ P_4
P_1 ⊥ P_3
P_1 ⊥ P_5
uniquely determine reln between a's + b's.
a_1 = b_1
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P_0/Q_0 , P_0/Q_1 , P_1/Q_1 , P_1/Q_2

$$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0 \quad \text{if } n \neq m.$$

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$$\left.\begin{array}{l} P_0 \perp P_2 \\ P_2 \perp P_4 \\ P_0 \perp P_4 \\ P_1 \perp P_3 \\ P_1 \perp P_5 \\ \vdots \end{array}\right\}$$

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$\vdots$

$\boxed{P_n^m(x)} = \dfrac{\text{Poly of deg } m}{\text{Poly of deg } n}$

$\dfrac{P_0}{Q_0}, \dfrac{P_0}{Q_1}, \dfrac{P_1}{Q_1}, \dfrac{P_1}{Q_2}, \dfrac{P_2}{Q_2}, \dfrac{P_2}{Q_3}, \dfrac{P_3}{Q_3}$

Padé

$P_0^0, P_1^0, P_1^1, P_2^1, P_2^2, P_3^2, P_3^3 \cdots$

$$\int_{-L}^{L} dx\, P_n(x)\, P_m(x)\, W(x) = 0 \quad \text{if } n \neq m.$$

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$P_0 \perp P_2$
$P_2 \perp P_4$
$P_0 \perp P_4$
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$P_1 \perp P_5$
⋮

uniquely determine reln between a's + b's.

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⋮

$\boxed{P_n^m(x)} = \dfrac{\text{Poly of deg } m}{\text{Poly of deg } n}$

$\dfrac{P_0}{Q_0}, \dfrac{P_0}{Q_1}, \dfrac{P_1}{Q_1}, \dfrac{P_1}{Q_2}, \dfrac{P_2}{Q_2}, \dfrac{P_2}{Q_3}, \dfrac{P_3}{Q_3}$

Padé

$P_0^0, P_1^0, P_1^1, P_2^1, P_2^2, P_3^2, P_3^3 \ldots$

"main" or "diagonal"

P_5^2

$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}}$$

$$\text{ANS}(\epsilon) \sim \sum_{0}^{\infty} a_n \epsilon^n \qquad \sum_{0}^{N} a_n \epsilon^n$$

$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}}$$

$$\mathrm{ANS}(\epsilon) \sim \sum_0^{\infty} a_n \epsilon^n$$

$$\sum_0^{N} a_n \epsilon^n = P_n^m(\epsilon)$$

$$N = n+m$$

N+1 coeffs.

$a_0, a_1, \ldots, a_N$

$$\frac{\mathrm{Poly}_m \; (m+1)}{\mathrm{Poly}\; n \; (n+1)}$$

$$\cfrac{1}{1-\cfrac{b_1 x}{1-\cfrac{b_2 x}{1-b_3 x \cdots}}}$$

$$\mathrm{ANS}(\epsilon) \sim \sum_{0}^{\infty} a_n \epsilon^n$$

$$\sum_{0}^{N} a_n \epsilon^n = P^m_n(\epsilon)$$

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N+1 coeffs.

$a_0, a_1, \ldots a_N$

$$\frac{\mathrm{Poly}_m \; (m+1)}{\mathrm{Poly}_n \; (n)}$$

$$x^n + \_\, x^{n-1}$$

$$N+1 = \underline{n+m+1}$$

$$N = n+m \quad \checkmark$$

$$x^5 + x = 1$$

$$x_0 = 0.75487767$$

$$\boxed{\epsilon x^5 + x = 1}$$

$$x = 1 - \epsilon + 5\epsilon^2 - 35\epsilon^3 + 285\epsilon^4 - 2530\epsilon^5 + 23751\epsilon^6 + \cdots$$

$$a_n = \frac{(-1)^n (5n)!}{n!(4n+1)!} \qquad R = \frac{4^4}{5^5} = 0.08192$$

$$x(1) = \sum_{n=0}^{6} a_n = 21476$$

$$[3,3]\text{-Padé} \longrightarrow 0.76369 \quad [1.2\%\ \text{error}]$$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{\ldots} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x^5 + x = 1$$

$$x_0 = 0.75487767$$

$$\boxed{\epsilon x^5 + x = 1}$$

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$$[3,3]\text{-Padé} \longrightarrow 0.76369 \quad [1.2\% \text{ error}]$$

$$\boxed{x^5 + \epsilon x = 1}$$

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$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$x(1) = \sum_{n=0}^{6} a_n = 21476$$

$$[3,3]\text{-Padé} \longrightarrow 0.76369 \quad [1.2\%\ \text{error}]$$

$$\boxed{\underline{x^5 + \epsilon x = 1}}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\%\ \text{error})$$

$$\boxed{\underline{x^{1+\delta} + x = 1}} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R=1$

$[3,3]$-Padé $\longrightarrow$ $0.76\ldots$ $[\ldots\%\ \text{error}]$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

$[3,3$ Padé$]$ 0.75448 $(0.05\%$ error$)$

$[6,6$ Padé$]$ $0.7548765 4$ $(0.00015\ \%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76...

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$X(1)= 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta) = c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548763454 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [..% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5\,n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548 7654 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ [illegible] [[illegible]]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.75487654 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76...

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\tfrac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\tfrac{1}{2} \qquad c_1=\tfrac{1}{4}\ln 2 \qquad c_2=-\tfrac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)= c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

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$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.[illegible] [[illegible]]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] $0.7548765 4$ (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 $(0.05\,\%$ error$)$

[6,6 Padé] 0.7548754 $(0.00015\,\%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.7[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.75487654 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548763 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76... [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.[illegible] [[illegible] error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76…

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ [illegible] [[illegible] error]

$$\boxed{x^5 + \epsilon x = 1}$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ ...

$$\boxed{x^5+\epsilon x=1}$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [% error]

$$\boxed{x^5 + \epsilon x = 1}$$

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [% error]

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible] [illegible]

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[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

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[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.765… [… % error]

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible] [illegible]

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$$R = 1$$

[3,3 Padé] 0.75448 $(0.05\,\%$ error$)$

[6,6 Padé] $0.7548765 4$ $(0.00015\,\%$ error$)$

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible]% error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)=0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5 n!\, \Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [1.1% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$X(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.76507 [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76389 [...% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548763 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 $(0.05\,\%$ error$)$

[6,6 Padé] $0.7548765 4$ $(0.00015\,\%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76507 [...% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\Longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{\underline{x^5 + \epsilon x = 1}}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548 7654 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.7[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.7[illegible] [[illegible] % error]

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[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

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[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

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$X(1) = 0.75434$ (0.07 % error)

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$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [% error]

$$\boxed{x^5 + \epsilon x = 1}$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [... % error]

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765[illegible]4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

$[3,3$ Padé$]$ 0.75448 $(0.05\,\%$ error$)$

$[6,6$ Padé$]$ $0.7548765 4$ $(0.00015\,\%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76... [... % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [1.4% error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)=0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\Rightarrow$ 0.7656... [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\text{ \% error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\Longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5 n!\, \Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548764 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\tfrac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\tfrac{1}{2} \qquad c_1=\tfrac{1}{4}\ln 2 \qquad c_2=-\tfrac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548764 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.7[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76... [...% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \tfrac{1}{2} \qquad c_1 = \tfrac{1}{4}\ln 2 \qquad c_2 = -\tfrac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765[4] (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ 0.7[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 $(0.05\%$ error$)$

[6,6 Padé] $0.7548765 4$ $(0.00015\ \%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.75487654 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \qquad (0.07\%\ \text{error})$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\tfrac{1}{5}\epsilon-\tfrac{1}{25}\epsilon^2-\tfrac{1}{125}\epsilon^3+\tfrac{21}{15625}\epsilon^5+\tfrac{78}{78125}\epsilon^6+\cdots$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

$[3,3$ Padé$]$ 0.75448 (0.05 % error)

$[6,6$ Padé$]$ 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5+\epsilon x=1}$$

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$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5+\epsilon x=1}$$

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$x(1)=0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

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$R=1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

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$R = 1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

$[3,3$ Padé$]$ 0.75448 (0.05 % error)

$[6,6$ Padé$]$ 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

$[3,3$ Padé$]$ 0.75448 $(0.05\,\%$ error$)$

$[6,6$ Padé$]$ $0.7548765 4$ $(0.00015\,\%$ error$)$

$[3,3]$-Pade $\Longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5 n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.7650? [?% error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$R = 1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

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$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

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$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible] [[illegible] error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$x(1) = 0.75434 \qquad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$x(1) = 0.75434$ (0.07 % error)

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)= 0.75434 \quad (0.07\%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

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$R=1$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76... [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \tfrac{1}{5}\epsilon - \tfrac{1}{25}\epsilon^2 - \tfrac{1}{125}\epsilon^3 + \tfrac{21}{15625}\epsilon^5 + \tfrac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548763 54 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\ \text{error})$$

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

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$R = 1$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\Longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$X(1) = 0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.75487654 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ [illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76[illegible] [[illegible] % error]

$$\boxed{x^5 + \epsilon x = 1}$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

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$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507

$$\boxed{x^5 + \epsilon x = 1}$$

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [illegible]

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.75487654 (0.00015 % error)

$[3,3]$-Padé $\longrightarrow$ 0.76... [...% error]

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$R=1$

$[3,3$ Padé$]$ 0.75448 (0.05 % error)

$[6,6$ Padé$]$ 0.7548765 4 (0.00015 % error)

[3,3]-Pade $\longrightarrow$ 0.[illegible] [[illegible] % error]

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[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548754 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

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[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

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[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

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[3,3]-Padé $\longrightarrow$ 0.76507 [[illegible] % error]

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$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

$$c_3 = -\frac{1}{48}\ln^3 2 + \frac{1}{32}\ln^2 2 + \frac{1}{16}\ln 2$$

$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \quad (0.07\ \%\ \text{error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548765 4 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ [illegible]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\text{ error})$$

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$$R = 1$$

[3,3 Padé] 0.75448 $(0.05\,\%$ error$)$

[6,6 Padé] $0.7548765$4 $(0.00015\,\%$ error$)$

[3,3]-Padé $\longrightarrow$ 0.76507 [... % error]

$$\boxed{x^5 + \epsilon x = 1}$$

$$x = 1 - \frac{1}{5}\epsilon - \frac{1}{25}\epsilon^2 - \frac{1}{125}\epsilon^3 + \frac{21}{15625}\epsilon^5 + \frac{78}{78125}\epsilon^6 + \cdots$$

$$b_n = \frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R = \frac{5}{4^{4/5}} = 1.64938\ldots$$

$$x(1) = 0.75434 \qquad (0.07\,\%\text{ error})$$

$$\boxed{x^{1+\delta} + x = 1} \qquad x(\delta) = c_0 + c_1\delta + c_2\delta^2 + c_3\delta^3 + \cdots$$

$$c_0 = \frac{1}{2} \qquad c_1 = \frac{1}{4}\ln 2 \qquad c_2 = -\frac{1}{8}\ln 2$$

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$$c_4 = \frac{1}{32}\ln^3 2 - \frac{3}{64}\ln^2 2 - \frac{1}{32}\ln 2$$

$$R = 1$$

[3,3 Padé] 0.75448 (0.05 % error)

[6,6 Padé] 0.7548 7654 (0.00015 % error)

[3,3]-Padé $\longrightarrow$ 0.76507 [% error]

$$\boxed{x^5+\epsilon x=1}$$

$$x = 1-\frac{1}{5}\epsilon-\frac{1}{25}\epsilon^2-\frac{1}{125}\epsilon^3+\frac{21}{15625}\epsilon^5+\frac{78}{78125}\epsilon^6+\cdots$$

$$b_n=\frac{-\Gamma\left(\frac{4n-1}{5}\right)}{5n!\,\Gamma\left(\frac{4-n}{5}\right)} \qquad R=\frac{5}{4^{4/5}}=1.64938\ldots$$

$$x(1)=0.75434 \qquad (0.07\,\%\ \text{error})$$

$$\boxed{x^{1+\delta}+x=1} \qquad x(\delta)=c_0+c_1\delta+c_2\delta^2+c_3\delta^3+\cdots$$

$$c_0=\frac{1}{2} \qquad c_1=\frac{1}{4}\ln 2 \qquad c_2=-\frac{1}{8}\ln 2$$

$$c_3=-\frac{1}{48}\ln^3 2+\frac{1}{32}\ln^2 2+\frac{1}{16}\ln 2$$

$$c_4=\frac{1}{32}\ln^3 2-\frac{3}{64}\ln^2 2-\frac{1}{32}\ln 2$$

$$R=1$$

[3,3 Padé] 0.75448 (0.05% error)

[6,6 Padé] 0.7548754 (0.00015 % error)

Table 8.9 A comparison of the convergence rates of the Taylor and Padé approximants to e^x at $x = 1$

The actual values of the approximants and their relative errors [relative error = (approximant − exact value)/exact value] are listed. Observe that (*a*) the Taylor approximants are monotone increasing while the Padé approximants have errors with the sign pattern $++--++--\cdots$, which will be explained in Sec. 8.5; and (*b*) each Padé approximant is constructed from and contains the same information as the Taylor approximant listed on the same line, but its relative error is noticeably smaller. It will be shown in Sec. 8.5 that the error in the Padé approximants is smaller than the error in the Taylor approximants by a factor proportional to 2^n as $n \to +\infty$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{1}{k!}$	Padé approximant $P_M^N(1)$	Taylor series	Padé approximant
0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\ 75$	−5.94 (−4)	1.72 (−4)
6	2.718 06	$P_3^3 = 2.718\ 31$	−8.32 (−5)	1.03 (−5)
7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\ 28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\ 28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\ 28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\ 28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)

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16	2.718 28	$P_8^8 = 2.718\ 28$	$-1.09\ (-15)$	$-2.22\ (-19)$
17	2.718 28	$P_9^8 = 2.718\ 28$	$-6.06\ (-17)$	$6.89\ (-21)$
18	2.718 28	$P_9^9 = 2.718\ 28$	$-3.18\ (-18)$	$1.71\ (-22)$
19	2.718 28	$P_{10}^9 = 2.718\ 28$	$-1.59\ (-19)$	$-4.74\ (-24)$
20	2.718 28	$P_{10}^{10} = 2.718\ 28$	$-7.54\ (-21)$	$-1.07\ (-25)$

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4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\ 75$	−5.94 (−4)	1.72 (−4)
6	2.718 06	$P_3^3 = 2.718\ 31$	−8.32 (−5)	1.03 (−5)
7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\ 28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\ 28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\ 28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\ 28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
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16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
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18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
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0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
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7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\ 28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\ 28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\ 28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\ 28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)
16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
17	2.718 28	$P_9^8 = 2.718\ 28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
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2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
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10	2.718 28	$P_5^5 = 2.718\ 28$	$-1.00\ (-8)$	$1.02\ (-10)$
11	2.718 28	$P_6^5 = 2.718\ 28$	$-8.32\ (-10)$	$-5.02\ (-12)$
12	2.718 28	$P_6^6 = 2.718\ 28$	$-6.36\ (-11)$	$-1.77\ (-13)$
13	2.718 28	$P_7^6 = 2.718\ 28$	$-4.52\ (-12)$	$7.31\ (-15)$
14	2.718 28	$P_7^7 = 2.718\ 28$	$-3.00\ (-13)$	$2.27\ (-16)$
15	2.718 28	$P_8^7 = 2.718\ 28$	$-1.87\ (-14)$	$-8.03\ (-18)$
16	2.718 28	$P_8^8 = 2.718\ 28$	$-1.09\ (-15)$	$-2.22\ (-19)$
17	2.718 28	$P_9^8 = 2.718\ 28$	$-6.06\ (-17)$	$6.89\ (-21)$
18	2.718 28	$P_9^9 = 2.718\ 28$	$-3.18\ (-18)$	$1.71\ (-22)$
19	2.718 28	$P_{10}^9 = 2.718\ 28$	$-1.59\ (-19)$	$-4.74\ (-24)$
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3	2.666 67	$P_2^1 = 2.666\ 67$	$-1.90\ (-2)$	$-1.90\ (-2)$
4	2.708 33	$P_2^2 = 2.714\ 29$	$-3.66\ (-3)$	$-1.47\ (-3)$
5	2.716 67	$P_3^2 = 2.718\ 75$	$-5.94\ (-4)$	$1.72\ (-4)$
6	2.718 06	$P_3^3 = 2.718\ 31$	$-8.32\ (-5)$	$1.03\ (-5)$
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18	2.718 28	$P_9^9 = 2.718\,28$	−3.18 (−18)	1.71 (−22)
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12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)
16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
17	2.718 28	$P_9^8 = 2.718\ 28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
20	2.718 28	$P_{10}^{10} = 2.718\ 28$	−7.54 (−21)	−1.07 (−25)

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1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\,67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\,29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\,75$	−5.94 (−4)	1.72 (−4)
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18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
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18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
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2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\,67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\,29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\,75$	−5.94 (−4)	1.72 (−4)
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Table 8.9 A comparison of the convergence rates of the Taylor and Padé approximants to e^x at $x = 1$

The actual values of the approximants and their relative errors [relative error = (approximant − exact value)/exact value] are listed. Observe that (*a*) the Taylor approximants are monotone increasing while the Padé approximants have errors with the sign pattern $+ + - - + + - - \cdots$, which will be explained in Sec. 8.5; and (*b*) each Padé approximant is constructed from and contains the same information as the Taylor approximant listed on the same line, but its relative error is noticeably smaller. It will be shown in Sec. 8.5 that the error in the Padé approximants is smaller than the error in the Taylor approximants by a factor proportional to 2^n as $n \to +\infty$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{1}{k!}$	Padé approximant $P_M^N(1)$	Taylor series	Padé approximant
0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\ 75$	−5.94 (−4)	1.72 (−4)
6	2.718 06	$P_3^3 = 2.718\ 31$	−8.32 (−5)	1.03 (−5)
7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\ 28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\ 28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\ 28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\ 28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)
16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
17	2.718 28	$P_9^8 = 2.718\ 28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
20	2.718 28	$P_{10}^{10} = 2.718\ 28$	−7.54 (−21)	−1.07 (−25)

Table 8.9 A comparison of the convergence rates of the Taylor and Padé approximants to e^x at $x = 1$

The actual values of the approximants and their relative errors [relative error = (approximant − exact value)/exact value] are listed. Observe that (*a*) the Taylor approximants are monotone increasing while the Padé approximants have errors with the sign pattern $+ + - - + + - - \cdots$, which will be explained in Sec. 8.5; and (*b*) each Padé approximant is constructed from and contains the same information as the Taylor approximant listed on the same line, but its relative error is noticeably smaller. It will be shown in Sec. 8.5 that the error in the Padé approximants is smaller than the error in the Taylor approximants by a factor proportional to 2^n as $n \to +\infty$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{1}{k!}$	Padé approximant $P_M^N(1)$	Taylor series	Padé approximant
0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\ 75$	−5.94 (−4)	1.72 (−4)
6	2.718 06	$P_3^3 = 2.718\ 31$	−8.32 (−5)	1.03 (−5)
7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\ 28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\ 28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\ 28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\ 28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)
16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
17	2.718 28	$P_9^8 = 2.718\ 28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
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The actual values of the approximants and their relative errors [relative error = (approximant − exact value)/exact value] are listed. Observe that (*a*) the Taylor approximants are monotone increasing while the Padé approximants have errors with the sign pattern $+ + - - + + - - \cdots$, which will be explained in Sec. 8.5; and (*b*) each Padé approximant is constructed from and contains the same information as the Taylor approximant listed on the same line, but its relative error is noticeably smaller. It will be shown in Sec. 8.5 that the error in the Padé approximants is smaller than the error in the Taylor approximants by a factor proportional to 2^n as $n \to +\infty$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{1}{k!}$	Padé approximant $P_M^N(1)$	Taylor series	Padé approximant
0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\ 67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\ 29$	−3.66 (−3)	−1.47 (−3)
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7	2.718 25	$P_4^3 = 2.718\ 28$	−1.02 (−5)	−8.31 (−7)
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12	2.718 28	$P_6^6 = 2.718\ 28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\ 28$	−4.52 (−12)	7.31 (−15)
14	2.718 28	$P_7^7 = 2.718\ 28$	−3.00 (−13)	2.27 (−16)
15	2.718 28	$P_8^7 = 2.718\ 28$	−1.87 (−14)	−8.03 (−18)
16	2.718 28	$P_8^8 = 2.718\ 28$	−1.09 (−15)	−2.22 (−19)
17	2.718 28	$P_9^8 = 2.718\ 28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\ 28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\ 28$	−1.59 (−19)	−4.74 (−24)
20	2.718 28	$P_{10}^{10} = 2.718\ 28$	−7.54 (−21)	−1.07 (−25)

Table 8.9 A comparison of the convergence rates of the Taylor and Padé approximants to e^x at $x = 1$

The actual values of the approximants and their relative errors [relative error = (approximant − exact value)/exact value] are listed. Observe that (*a*) the Taylor approximants are monotone increasing while the Padé approximants have errors with the sign pattern $++--++--\cdots$, which will be explained in Sec. 8.5; and (*b*) each Padé approximant is constructed from and contains the same information as the Taylor approximant listed on the same line, but its relative error is noticeably smaller. It will be shown in Sec. 8.5 that the error in the Padé approximants is smaller than the error in the Taylor approximants by a factor proportional to 2^n as $n \to +\infty$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{1}{k!}$	Padé approximant $P_M^N(1)$	Taylor series	Padé approximant
0	1.0	$P_0^0 = 1$		
1	2.0	$P_1^0 = \infty$	−2.64 (−1)	∞
2	2.5	$P_1^1 = 3$	−8.03 (−2)	1.04 (−1)
3	2.666 67	$P_2^1 = 2.666\,67$	−1.90 (−2)	−1.90 (−2)
4	2.708 33	$P_2^2 = 2.714\,29$	−3.66 (−3)	−1.47 (−3)
5	2.716 67	$P_3^2 = 2.718\,75$	−5.94 (−4)	1.72 (−4)
6	2.718 06	$P_3^3 = 2.718\,31$	−8.32 (−5)	1.03 (−5)
7	2.718 25	$P_4^3 = 2.718\,28$	−1.02 (−5)	−8.31 (−7)
8	2.718 28	$P_4^4 = 2.718\,28$	−1.13 (−6)	−4.05 (−8)
9	2.718 28	$P_5^4 = 2.718\,28$	−1.11 (−7)	2.48 (−9)
10	2.718 28	$P_5^5 = 2.718\,28$	−1.00 (−8)	1.02 (−10)
11	2.718 28	$P_6^5 = 2.718\,28$	−8.32 (−10)	−5.02 (−12)
12	2.718 28	$P_6^6 = 2.718\,28$	−6.36 (−11)	−1.77 (−13)
13	2.718 28	$P_7^6 = 2.718\,28$	−4.52 (−12)	7.31 (−15)
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17	2.718 28	$P_9^8 = 2.718\,28$	−6.06 (−17)	6.89 (−21)
18	2.718 28	$P_9^9 = 2.718\,28$	−3.18 (−18)	1.71 (−22)
19	2.718 28	$P_{10}^9 = 2.718\,28$	−1.59 (−19)	−4.74 (−24)
20	2.718 28	$P_{10}^{10} = 2.718\,28$	−7.54 (−21)	−1.07 (−25)

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33(-1)$	$-5.19(-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81(-2)$	$-1.33(-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18(-2)$	$6.88(-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37(-2)$	$8.65(-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45(-3)$	$-2.78(-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02(-3)$	$-3.43(-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98(-4)$	$9.05(-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26(-4)$	$1.03(-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90(-5)$	$-2.28(-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99(-5)$	$-2.41(-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42(-6)$	$4.56(-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40(-6)$	$4.48(-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45(-7)$	$-7.43(-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11(-8)$	$-6.81(-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82(-8)$	$1.00(-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91(-9)$	$8.58(-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07(-10)$	$-1.13(-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60(-10)$	$-9.13(-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05(-11)$	$1.09(-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60(-12)$	$8.29(-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33\,(-1)$	$-5.19\,(-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81\,(-2)$	$-1.33\,(-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18\,(-2)$	$6.88\,(-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37\,(-2)$	$8.65\,(-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45\,(-3)$	$-2.78\,(-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02\,(-3)$	$-3.43\,(-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98\,(-4)$	$9.05\,(-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26\,(-4)$	$1.03\,(-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90\,(-5)$	$-2.28\,(-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99\,(-5)$	$-2.41\,(-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42\,(-6)$	$4.56\,(-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40\,(-6)$	$4.48\,(-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45\,(-7)$	$-7.43\,(-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11\,(-8)$	$-6.81\,(-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82\,(-8)$	$1.00\,(-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91\,(-9)$	$8.58\,(-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07\,(-10)$	$-1.13\,(-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60\,(-10)$	$-9.13\,(-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05\,(-11)$	$1.09\,(-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60\,(-12)$	$8.29\,(-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
7	128.619	$P_4^3 =$ 71.385	−1.33 (−1)	−5.19 (−1)
8	138.307	$P_4^4 =$ 128.619	−6.81 (−2)	−1.33 (−1)
9	143.689	$P_5^4 =$ 158.621	−3.18 (−2)	6.88 (−2)
10	146.381	$P_5^5 =$ 149.697	−1.37 (−2)	8.65 (−3)
11	147.604	$P_6^5 =$ 148.001	−5.45 (−3)	−2.78 (−3)
12	148.114	$P_6^6 =$ 148.362	−2.02 (−3)	−3.43 (−4)
13	148.310	$P_7^6 =$ 148.427	−6.98 (−4)	9.05 (−5)
14	148.380	$P_7^7 =$ 148.415	−2.26 (−4)	1.03 (−5)
15	148.403	$P_8^7 =$ 148.413	−6.90 (−5)	−2.28 (−6)
16	148.410	$P_8^8 =$ 148.413	−1.99 (−5)	−2.41 (−7)
17	148.412	$P_9^8 =$ 148.143	−5.42 (−6)	4.56 (−8)
18	148.413	$P_9^9 =$ 148.413	−1.40 (−6)	4.48 (−9)
19	148.413	$P_{10}^9 =$ 148.413	−3.45 (−7)	−7.43 (−10)
20	148.413	$P_{10}^{10} =$ 148.413	−8.11 (−8)	−6.81 (−11)
21	148.413	$P_{11}^{10} =$ 148.413	−1.82 (−8)	1.00 (−11)
22	148.413	$P_{11}^{11} =$ 148.413	−3.91 (−9)	8.58 (−13)
23	148.413	$P_{12}^{11} =$ 148.413	−8.07 (−10)	−1.13 (−13)
24	148.413	$P_{12}^{12} =$ 148.413	−1.60 (−10)	−9.13 (−15)
25	148.413	$P_{13}^{12} =$ 148.413	−3.05 (−11)	1.09 (−15)
26	148.413	$P_{13}^{13} =$ 148.413	−5.60 (−12)	8.29 (−17)

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90\ (-5)$	$-2.28\ (-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99\ (-5)$	$-2.41\ (-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11\ (-8)$	$-6.81\ (-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82\ (-8)$	$1.00\ (-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91\ (-9)$	$8.58\ (-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{\infty} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90\ (-5)$	$-2.28\ (-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99\ (-5)$	$-2.41\ (-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11\ (-8)$	$-6.81\ (-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82\ (-8)$	$1.00\ (-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91\ (-9)$	$8.58\ (-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{\infty} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90\ (-5)$	$-2.28\ (-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99\ (-5)$	$-2.41\ (-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11\ (-8)$	$-6.81\ (-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82\ (-8)$	$1.00\ (-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91\ (-9)$	$8.58\ (-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
7	128.619	$P_4^3 =$ 71.385	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P_4^4 =$ 128.619	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P_5^4 =$ 158.621	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P_5^5 =$ 149.697	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P_6^5 =$ 148.001	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P_6^6 =$ 148.362	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P_7^6 =$ 148.427	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 =$ 148.415	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P_8^7 =$ 148.413	$-6.90\ (-5)$	$-2.28\ (-6)$
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Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 =$ 71.385	−1.33 (−1)	−5.19 (−1)
8	138.307	$P_4^4 =$ 128.619	−6.81 (−2)	−1.33 (−1)
9	143.689	$P_5^4 =$ 158.621	−3.18 (−2)	6.88 (−2)
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14	148.380	$P_7^7 =$ 148.415	−2.26 (−4)	1.03 (−5)
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20	148.413	$P_{10}^{10} =$ 148.413	−8.11 (−8)	−6.81 (−11)
21	148.413	$P_{11}^{10} =$ 148.413	−1.82 (−8)	1.00 (−11)
22	148.413	$P_{11}^{11} =$ 148.413	−3.91 (−9)	8.58 (−13)
23	148.413	$P_{12}^{11} =$ 148.413	−8.07 (−10)	−1.13 (−13)
24	148.413	$P_{12}^{12} =$ 148.413	−1.60 (−10)	−9.13 (−15)
25	148.413	$P_{13}^{12} =$ 148.413	−3.05 (−11)	1.09 (−15)
26	148.413	$P_{13}^{13} =$ 148.413	−5.60 (−12)	8.29 (−17)

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
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n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 =$ 71.385	$-1.33\ (-1)$	$-5.19\ (-1)$
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n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
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23	148.413	$P_{12}^{11} = 148.413$	$-8.07(-10)$	$-1.13(-13)$
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Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	−1.33 (−1)	−5.19 (−1)
8	138.307	$P_4^4 = 128.619$	−6.81 (−2)	−1.33 (−1)
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20	148.413	$P_{10}^{10} = 148.413$	−8.11 (−8)	−6.81 (−11)
21	148.413	$P_{11}^{10} = 148.413$	−1.82 (−8)	1.00 (−11)
22	148.413	$P_{11}^{11} = 148.413$	−3.91 (−9)	8.58 (−13)
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26	148.413	$P_{13}^{13} = 148.413$	−5.60 (−12)	8.29 (−17)

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P^N_M(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P^3_4 =$ 71.385	−1.33 (−1)	−5.19 (−1)
8	138.307	$P^4_4 =$ 128.619	−6.81 (−2)	−1.33 (−1)
9	143.689	$P^4_5 =$ 158.621	−3.18 (−2)	6.88 (−2)
10	146.381	$P^5_5 =$ 149.697	−1.37 (−2)	8.65 (−3)
11	147.604	$P^5_6 =$ 148.001	−5.45 (−3)	−2.78 (−3)
12	148.114	$P^6_6 =$ 148.362	−2.02 (−3)	−3.43 (−4)
13	148.310	$P^6_7 =$ 148.427	−6.98 (−4)	9.05 (−5)
14	148.380	$P^7_7 =$ 148.415	−2.26 (−4)	1.03 (−5)
15	148.403	$P^7_8 =$ 148.413	−6.90 (−5)	−2.28 (−6)
16	148.410	$P^8_8 =$ 148.413	−1.99 (−5)	−2.41 (−7)
17	148.412	$P^8_9 =$ 148.143	−5.42 (−6)	4.56 (−8)
18	148.413	$P^9_9 =$ 148.413	−1.40 (−6)	4.48 (−9)
19	148.413	$P^9_{10} =$ 148.413	−3.45 (−7)	−7.43 (−10)
20	148.413	$P^{10}_{10} =$ 148.413	−8.11 (−8)	−6.81 (−11)
21	148.413	$P^{10}_{11} =$ 148.413	−1.82 (−8)	1.00 (−11)
22	148.413	$P^{11}_{11} =$ 148.413	−3.91 (−9)	8.58 (−13)
23	148.413	$P^{11}_{12} =$ 148.413	−8.07 (−10)	−1.13 (−13)
24	148.413	$P^{12}_{12} =$ 148.413	−1.60 (−10)	−9.13 (−15)
25	148.413	$P^{12}_{13} =$ 148.413	−3.05 (−11)	1.09 (−15)
26	148.413	$P^{13}_{13} =$ 148.413	−5.60 (−12)	8.29 (−17)

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33(-1)$	$-5.19(-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81(-2)$	$-1.33(-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18(-2)$	$6.88(-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37(-2)$	$8.65(-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45(-3)$	$-2.78(-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02(-3)$	$-3.43(-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98(-4)$	$9.05(-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26(-4)$	$1.03(-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90(-5)$	$-2.28(-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99(-5)$	$-2.41(-7)$
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19	148.413	$P_{10}^9 = 148.413$	$-3.45(-7)$	$-7.43(-10)$
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21	148.413	$P_{11}^{10} = 148.413$	$-1.82(-8)$	$1.00(-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91(-9)$	$8.58(-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07(-10)$	$-1.13(-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60(-10)$	$-9.13(-15)$
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24	148.413	$P_{12}^{12} =$ 148.413	−1.60 (−10)	−9.13 (−15)
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Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
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13	148.310	$P_7^6 = 148.427$	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26\ (-4)$	$1.03\ (-5)$
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21	148.413	$P_{11}^{10} =$ 148.413	−1.82 (−8)	1.00 (−11)
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			Relative errors	
n	Taylor series $\sum_{k=0}^{\infty} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Taylor series	Padé approximants
7	128.619	$P_4^3 =$ 71.385	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P_4^4 =$ 128.619	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P_5^4 =$ 158.621	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P_5^5 =$ 149.697	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P_6^5 =$ 148.001	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P_6^6 =$ 148.362	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P_7^6 =$ 148.427	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P_7^7 =$ 148.415	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P_8^7 =$ 148.413	$-6.90\ (-5)$	$-2.28\ (-6)$
16	148.410	$P_8^8 =$ 148.413	$-1.99\ (-5)$	$-2.41\ (-7)$
17	148.412	$P_9^8 =$ 148.143	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P_9^9 =$ 148.413	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P_{10}^9 =$ 148.413	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P_{10}^{10} =$ 148.413	$-8.11\ (-8)$	$-6.81\ (-11)$
21	148.413	$P_{11}^{10} =$ 148.413	$-1.82\ (-8)$	$1.00\ (-11)$
22	148.413	$P_{11}^{11} =$ 148.413	$-3.91\ (-9)$	$8.58\ (-13)$
23	148.413	$P_{12}^{11} =$ 148.413	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P_{12}^{12} =$ 148.413	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P_{13}^{12} =$ 148.413	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P_{13}^{13} =$ 148.413	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P_M^N(5)$	Relative errors: Taylor series	Relative errors: Padé approximants
7	128.619	$P_4^3 = 71.385$	$-1.33(-1)$	$-5.19(-1)$
8	138.307	$P_4^4 = 128.619$	$-6.81(-2)$	$-1.33(-1)$
9	143.689	$P_5^4 = 158.621$	$-3.18(-2)$	$6.88(-2)$
10	146.381	$P_5^5 = 149.697$	$-1.37(-2)$	$8.65(-3)$
11	147.604	$P_6^5 = 148.001$	$-5.45(-3)$	$-2.78(-3)$
12	148.114	$P_6^6 = 148.362$	$-2.02(-3)$	$-3.43(-4)$
13	148.310	$P_7^6 = 148.427$	$-6.98(-4)$	$9.05(-5)$
14	148.380	$P_7^7 = 148.415$	$-2.26(-4)$	$1.03(-5)$
15	148.403	$P_8^7 = 148.413$	$-6.90(-5)$	$-2.28(-6)$
16	148.410	$P_8^8 = 148.413$	$-1.99(-5)$	$-2.41(-7)$
17	148.412	$P_9^8 = 148.143$	$-5.42(-6)$	$4.56(-8)$
18	148.413	$P_9^9 = 148.413$	$-1.40(-6)$	$4.48(-9)$
19	148.413	$P_{10}^9 = 148.413$	$-3.45(-7)$	$-7.43(-10)$
20	148.413	$P_{10}^{10} = 148.413$	$-8.11(-8)$	$-6.81(-11)$
21	148.413	$P_{11}^{10} = 148.413$	$-1.82(-8)$	$1.00(-11)$
22	148.413	$P_{11}^{11} = 148.413$	$-3.91(-9)$	$8.58(-13)$
23	148.413	$P_{12}^{11} = 148.413$	$-8.07(-10)$	$-1.13(-13)$
24	148.413	$P_{12}^{12} = 148.413$	$-1.60(-10)$	$-9.13(-15)$
25	148.413	$P_{13}^{12} = 148.413$	$-3.05(-11)$	$1.09(-15)$
26	148.413	$P_{13}^{13} = 148.413$	$-5.60(-12)$	$8.29(-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{n} \frac{5^k}{k!}$	Padé approximants $P^N_M(5)$	Taylor series	Padé approximants
7	128.619	$P^3_4 =$ 71.385	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P^4_4 =$ 128.619	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P^4_5 =$ 158.621	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P^5_5 =$ 149.697	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P^5_6 =$ 148.001	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P^6_6 =$ 148.362	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P^6_7 =$ 148.427	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P^7_7 =$ 148.415	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P^7_8 =$ 148.413	$-6.90\ (-5)$	$-2.28\ (-6)$
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17	148.412	$P^8_9 =$ 148.143	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P^9_9 =$ 148.413	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P^9_{10} =$ 148.413	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P^{10}_{10} =$ 148.413	$-8.11\ (-8)$	$-6.81\ (-11)$
21	148.413	$P^{10}_{11} =$ 148.413	$-1.82\ (-8)$	$1.00\ (-11)$
22	148.413	$P^{11}_{11} =$ 148.413	$-3.91\ (-9)$	$8.58\ (-13)$
23	148.413	$P^{11}_{12} =$ 148.413	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P^{12}_{12} =$ 148.413	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P^{12}_{13} =$ 148.413	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P^{13}_{13} =$ 148.413	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.10 Same as in Table 8.9 except that the approximants are evaluated at $x = 5$

			Relative errors	
n	Taylor series $\sum_{k=0}^{\infty} \frac{5^k}{k!}$	Padé approximants $P^N_M(5)$	Taylor series	Padé approximants
7	128.619	$P^3_4 = 71.385$	$-1.33\ (-1)$	$-5.19\ (-1)$
8	138.307	$P^4_4 = 128.619$	$-6.81\ (-2)$	$-1.33\ (-1)$
9	143.689	$P^4_5 = 158.621$	$-3.18\ (-2)$	$6.88\ (-2)$
10	146.381	$P^5_5 = 149.697$	$-1.37\ (-2)$	$8.65\ (-3)$
11	147.604	$P^5_6 = 148.001$	$-5.45\ (-3)$	$-2.78\ (-3)$
12	148.114	$P^6_6 = 148.362$	$-2.02\ (-3)$	$-3.43\ (-4)$
13	148.310	$P^6_7 = 148.427$	$-6.98\ (-4)$	$9.05\ (-5)$
14	148.380	$P^7_7 = 148.415$	$-2.26\ (-4)$	$1.03\ (-5)$
15	148.403	$P^7_8 = 148.413$	$-6.90\ (-5)$	$-2.28\ (-6)$
16	148.410	$P^8_8 = 148.413$	$-1.99\ (-5)$	$-2.41\ (-7)$
17	148.412	$P^8_9 = 148.143$	$-5.42\ (-6)$	$4.56\ (-8)$
18	148.413	$P^9_9 = 148.413$	$-1.40\ (-6)$	$4.48\ (-9)$
19	148.413	$P^9_{10} = 148.413$	$-3.45\ (-7)$	$-7.43\ (-10)$
20	148.413	$P^{10}_{10} = 148.413$	$-8.11\ (-8)$	$-6.81\ (-11)$
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23	148.413	$P^{11}_{12} = 148.413$	$-8.07\ (-10)$	$-1.13\ (-13)$
24	148.413	$P^{12}_{12} = 148.413$	$-1.60\ (-10)$	$-9.13\ (-15)$
25	148.413	$P^{12}_{13} = 148.413$	$-3.05\ (-11)$	$1.09\ (-15)$
26	148.413	$P^{13}_{13} = 148.413$	$-5.60\ (-12)$	$8.29\ (-17)$

Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8

Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z|<1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 3

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In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

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N	$x = 0.5$	$x = 1$	$x = 2$
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3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 3

Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
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7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 3

Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
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4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
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Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z|<1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
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3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
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In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

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N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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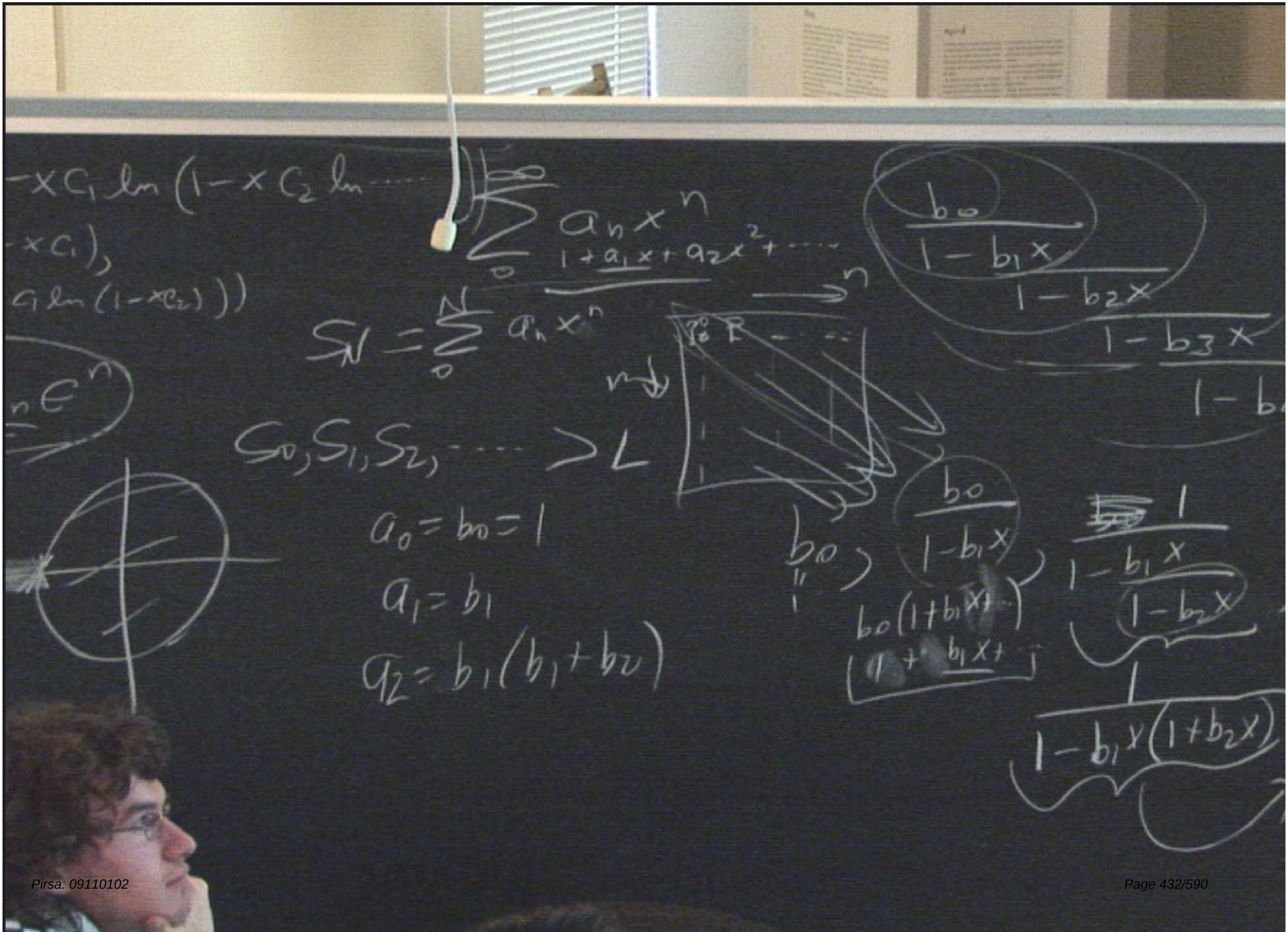

$S_N = \sum_0^N a_n x^n$
$S_0, S_1, S_2, \ldots \to L$
$a_0 = b_0 = 1$
$a_1 = b_1$
$a_2 = b_1(b_1 + b_2)$
$\sum_0^\infty a_n x^n$
$1 + a_1 x + a_2 x^2 + \cdots$
$1 - b_1 x$
$1 - b_2 x$
$1 - b_3 x$

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N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
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Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z|<1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln (1 + z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln (1 + x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln (1 + x)/x$

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5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

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$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
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Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1 + z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1 + x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1 + x)/x$

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N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 5

$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
6	0.810 930 216 2	0.693 147 180 7	0.549 306 177 9
7	0.810 930 216 2	0.693 147 180 6	0.549 306 146 7
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$P_{N+1}^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 3

Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1+z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

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N	$x = 0.5$	$x = 1$	$x = 2$
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1 + z)$ about $z = 0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z| < 1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1 + x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1 + x)/x$

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6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
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$P_N^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
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$P_{N+1}^N(x)$

N	$x = 0.5$	$x = 1$	$x = 2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
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Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z|<1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

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5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
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Table 8.13 Padé summation of the Taylor series for $z^{-1}\ln(1+z)$ about $z=0$

In Sec. 8.5, it will be shown that the sequences of Padé approximants $P_N^N(z)$ and $P_{N+1}^N(z)$ converge rapidly, even beyond the circle of convergence of the Taylor series $|z|<1$. Observe that for real positive x the Padé approximants $P_N^N(x)$ monotonically decrease and $P_{N+1}^N(x)$ monotonically increase with N to the common limit $\ln(1+x)/x$. Thus, for any N, these Padé approximants supply upper and lower bounds on $\ln(1+x)/x$

$P_N^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
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Table 8.13 Padé summation of the Taylor series for $z^{-1} \ln(1 + z)$ about $z = 0$

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N	$x = 0.5$	$x = 1$	$x = 2$
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1	0.812 500 000 0	0.700 000 000 0	0.571 428 571 4
2	0.810 945 273 6	0.693 333 333 3	0.550 724 637 7
3	0.810 930 365 3	0.693 152 454 8	0.549 402 823 0
4	0.810 930 217 7	0.693 147 332 4	0.549 312 879 5
5	0.810 930 216 2	0.693 147 185 0	0.549 306 618 4
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$P_{N+1}^N(x)$

N	$x=0.5$	$x=1$	$x=2$
1	0.810 810 810 8	0.692 307 692 3	0.545 454 545 5
2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
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2	0.810 928 961 7	0.693 121 693 1	0.549 019 607 8
3	0.810 930 203 2	0.693 146 417 4	0.549 285 176 8
4	0.810 930 216 1	0.693 147 157 9	0.549 304 620 9
5	0.810 930 216 2	0.693 147 179 9	0.549 306 034 1
6	0.810 930 216 2	0.693 147 180 5	0.549 306 136 4
7	0.810 930 216 2	0.693 147 180 6	0.549 306 143 8
8	0.810 930 216 2	0.693 147 180 6	0.549 306 144 3

$c_1 \ln(1-x c_2 \ln \cdots$

$c_1),$

$\ln(1-xc_2)))$

$$\sum_0^\infty a_n x^n$$

$$1 + a_1 x + a_2 x^2 + \cdots$$

$$S_N = \sum_0^N a_n x^n$$

$$S_0, S_1, S_2, \cdots \to L$$

$$a_0 = b_0 = 1$$

$$a_1 = b_1$$

$$a_2 = b_1(b_1 + b_2)$$

$$\cfrac{b_0}{1 - \cfrac{b_1 x}{1 - \cfrac{b_2 x}{1 - \cfrac{b_3 x}{1 - b_4 x}}}}$$

$$\frac{b_0}{1 - b_1 x}$$

$$b_0,$$

$$b_0(1 + b_1 x + \cdots)$$

$$(1 + b_1 x + \cdots)$$

$$\cfrac{1}{1 - \cfrac{b_1 x}{1 - b_2 x}}$$

$$\frac{1}{1 - b_1 x (1 + b_2 x)}$$

$1+b$

$+b$

$c_1 \ln(1 - x\, c_2 \ln \cdots$

$c_1)$,

$\ln(1 - x c_2)))$

$$\sum_0^\infty a_n x^n$$

$1 + a_1 x + a_2 x^2 + \cdots$

$\longrightarrow n$

$$S_N = \sum_0^N a_n x^n$$

$n \downarrow$

$S_0, S_1, S_2, \cdots \rightarrow L$

$a_0 = b_0 = 1$

$a_1 = b_1$

$a_2 = b_1(b_1 + b_2)$

$$\cfrac{b_0}{1 - \cfrac{b_1 x}{1 - \cfrac{b_2 x}{1 - \cfrac{b_3 x}{1 - b_4 x}}}}$$

$b_0, \quad \dfrac{b_0}{1 - b_1 x},$

$b_0(1 + b_1 x + \cdots)$

$(1 + b_1 x + \cdots)$

$\dfrac{1}{1 - \dfrac{b_1 x}{1 - b_2 x}}$,

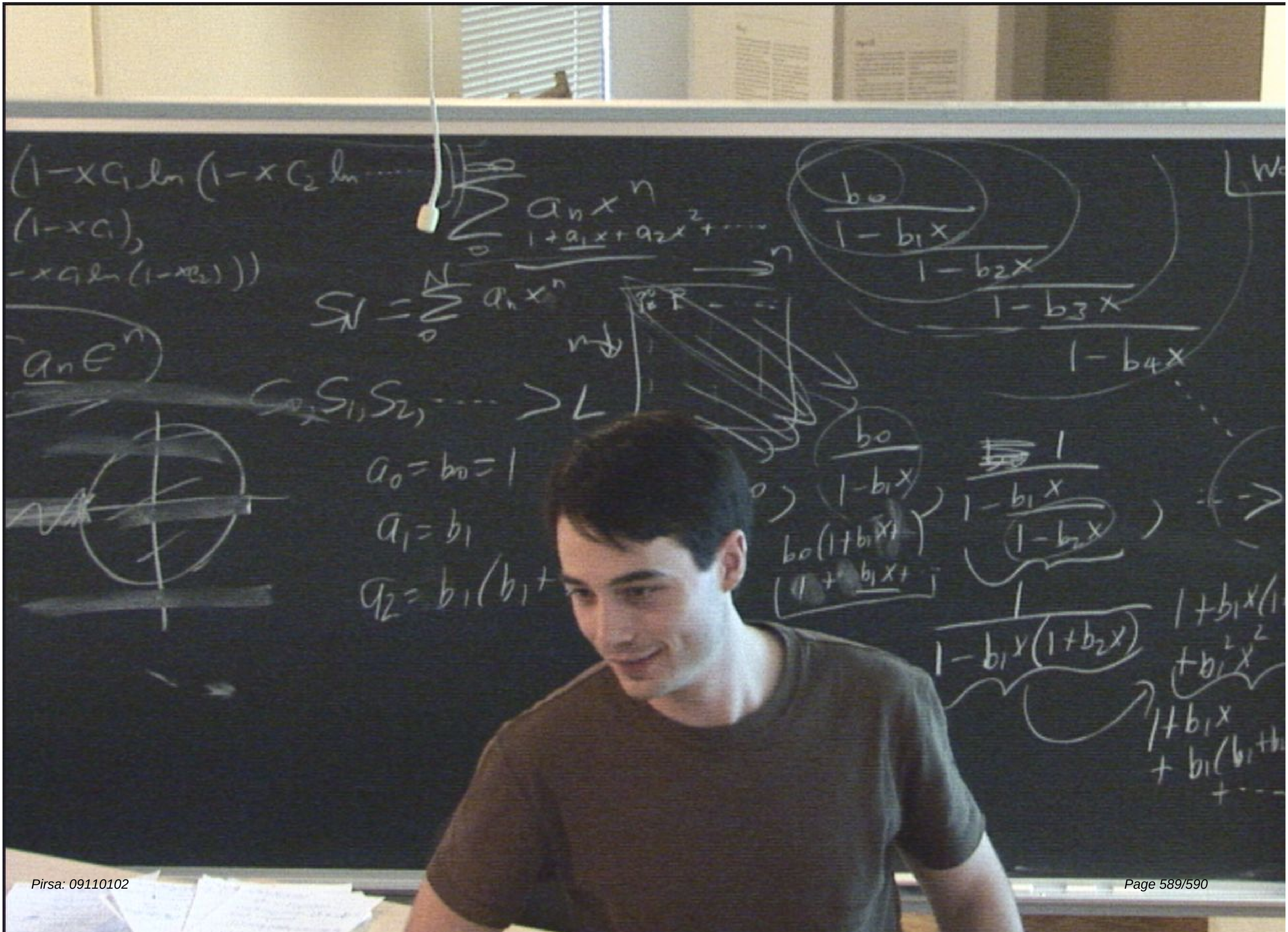
$\dfrac{1}{1 - b_1 x(1 + b_2 x)}$

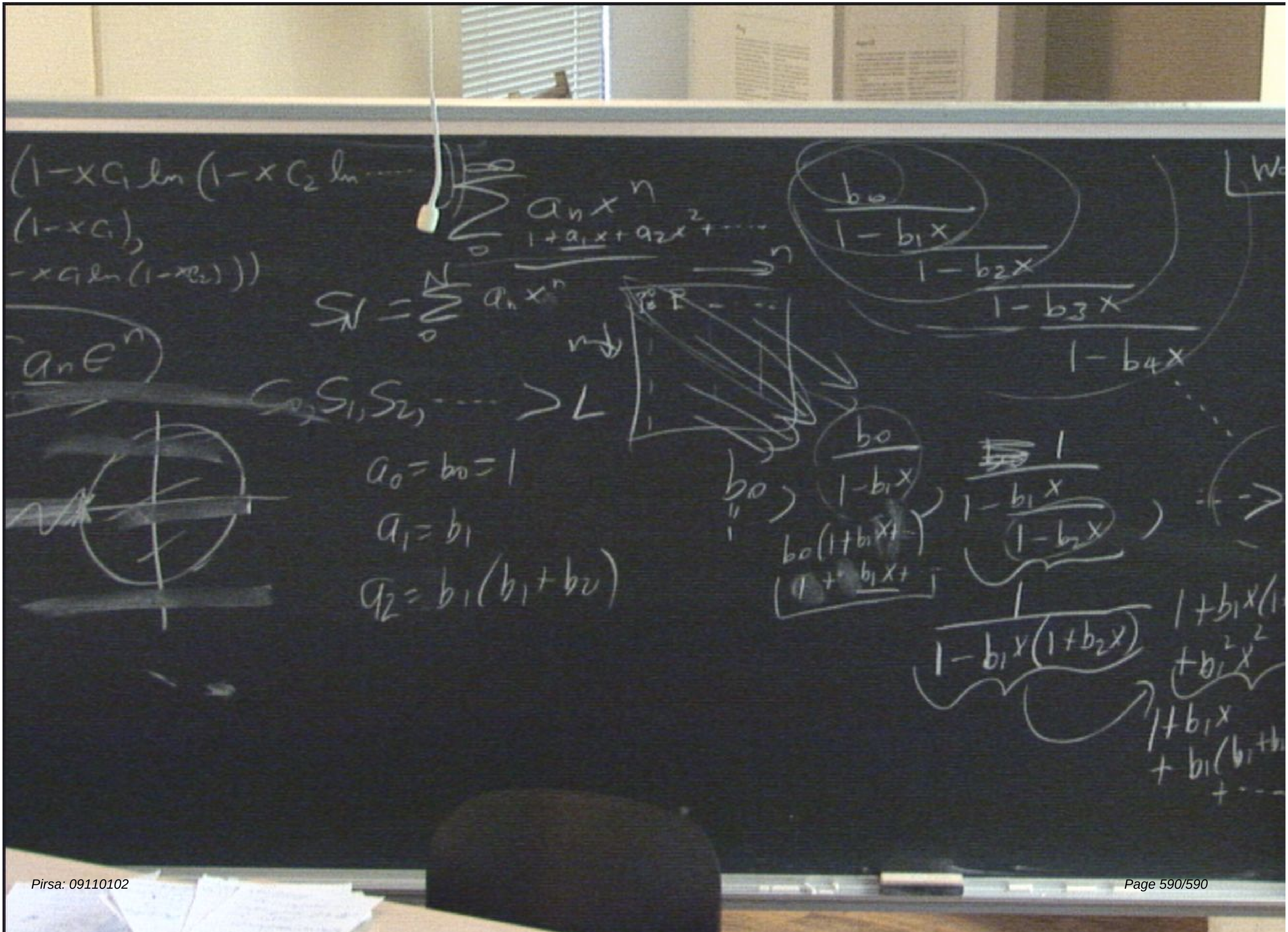
1

$+$

$1 + b$

$+ b$


1 − b1x
1 − b2x
1 − b3x
1 − b4x
a0 = b0 = 1
a1 = b1
S0, S1, S2, ... → L


$(1 - x c_1 \ln (1 - x c_2 \ln \cdots$
$\sum_0^\infty a_n x^n$
$1 + a_1 x + a_2 x^2 + \cdots$
$S_N = \sum_0^N a_n x^n$
$S_1, S_2, \cdots \to L$
$a_0 = b_0 = 1$
$a_1 = b_1$
$a_2 = b_1(b_1 + b_2)$
$\frac{b_0}{1 - \frac{b_1 x}{1 - \frac{b_2 x}{1 - \frac{b_3 x}{1 - b_4 x}}}}$
$b_0(1 + b_1 x + \cdots)$
$\frac{1}{1 - b_1 x (1 + b_2 x)}$
$1 + b_1 x$
$+ b_1(b_1 + b_2$
$+ \cdots$