Unit 15, part 81.12

Aphorisms, advices, anecdotes, brain teasers, curious stories, epigrams, epigraphs, epitaphs, crazy-creative ideas, suggestions and set pieces for thriller and mystery writers, koans, memorabilia, mottos, poems, proverbs, riddles, algorithmics ideas catchment areas, quotations, sayings, slogans, scurrilities, besun, etc., collected for encouragement and the advantage of my students and of myself.
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Continued fraction twins, Sandkasten

Teil 1, Folge der natürlichen Zahlen

$$A = \cfrac{1}{2+\cfrac{3}{4+\cfrac{5}{6+\cfrac{7}{8+\cfrac{9}{10+\cfrac{11}{12+\cfrac{13}{14+\cfrac{15}{16+\cdots}}}}}}}} = 0.379731954740995\ldots$$

$$= [0;2,1,1,1,2,1,2,10,2,2,\ldots] = ?$$

$$B = \cfrac{2}{1+\cfrac{4}{3+\cfrac{6}{5+\cfrac{8}{7+\cfrac{10}{9+\cfrac{12}{11+\cfrac{14}{13+\cfrac{16}{15+\cfrac{18}{17+\cdots}}}}}}}}} = 1 \quad ^{*)}$$

$$\alpha = \cfrac{1}{1+\cfrac{2}{2+\cfrac{3}{3+\cfrac{4}{4+\cfrac{5}{5+\cfrac{6}{6+\cfrac{7}{7+\cfrac{8}{8+\cdots}}}}}}}} = 0.5819767068693264\ldots$$

$$= [0;1,1,2,1,1,4,1,1,6,1,1,8,1,1,10,1,1,12,\ldots] \quad ^{**)}$$

$$= \frac{1}{e-1}$$

$$\alpha\alpha = \cfrac{1}{2+\cfrac{2}{3+\cfrac{3}{4+\cfrac{4}{5+\cfrac{5}{6+\cfrac{6}{7+\cfrac{7}{8+\cfrac{8}{9+\cdots}}}}}}}}} = 0.392211191177332814 38\ldots$$

$$= [0;2,1,1,4,1,1,6,1,1,8,1,1,10,1,1,12,\ldots]$$

$$= \frac{3-e}{e-2} = \frac{2\alpha-1}{1-\alpha}$$

$$\alpha\alpha\alpha = \cfrac{1}{3+\cfrac{2}{4+\cfrac{3}{5+\cfrac{4}{6+\cfrac{5}{7+\cfrac{6}{8+\cfrac{7}{9+\cdots}}}}}}} = 0.290616692785362221 1\ldots$$

$$= [0;3,2,3,1,2,1,3,4,3,1,4,1,3,6,3,1,3,8,3,1,8,1,\ldots]$$

$$= [0;3,2,3,1,2,1,$$

$$3,4,3,1,4,1,$$

$$3,6,3,1,6,1,$$

$$3,8,3,1,8,1,\ldots$$

$$\alpha\alpha\alpha\alpha = \cfrac{1}{4+\cfrac{2}{5+\cfrac{3}{6+\cfrac{4}{7+\cfrac{5}{8+\cfrac{6}{9+\cfrac{7}{10+\cdots}}}}}}} = 0.220479285645437809 33\ldots$$

$$= [0;4,1,1,6,1,1,8,1,1,10,1,1,12,1,1,14,\ldots]$$

$$= \frac{7e-9}{11-4e} = \frac{2-5\alpha\alpha}{3\alpha\alpha-1} = \frac{7-12\alpha}{7\alpha-4}$$

$$\alpha\alpha\alpha\alpha\alpha = \cfrac{1}{5+\cfrac{2}{6+\cfrac{3}{7+\cfrac{4}{8+\cfrac{5}{9+\cfrac{6}{10+\cfrac{7}{11+\cdots}}}}}}}$$

$$= 0.17852449202891387510972796892 0\ldots$$

$$= [0;5,1,1,1,1,\ 26,1,1,\ \ 3,5,1,\ \ 3,1,1,$$

$$44,1,1,\ \ 5,5,1,\ \ 5,1,1,$$

$$62,1,1,\ \ 7,5,1,\ \ 7,1,1,$$

$$80,1,1,\ \ 9,5,1,\ \ 9,1,1,$$

$$98,1,1,11,5,1,11,1,1,$$

$$116,1,1,13,5,1,13,1,1,\ldots]$$

$$\alpha\alpha\alpha\alpha\alpha\alpha = \cfrac{1}{6+\cfrac{2}{7+\cfrac{3}{8+\cfrac{4}{9+\cfrac{5}{10+\cfrac{6}{11+\cfrac{7}{12+\cdots}}}}}}}$$

$$= 0.15036807924097009753248282956 2\ldots$$

$$= [0;\ 6,\ 1,\ 1,\ 1,\ 6,\ 7,\ 24,\ 8,\ 1,\ 10,\ 2,\ 1,\ 1,\ 2,$$

3, 1, 4, 1, 2, 1, 1, 1, 15, 7, 1, 1, 23, 1, 1, 7, 1,

19, 2, 1, 1, 1, 1, 1, 3, 1, 4, 2, 2, 1 ,1, 1, 24, 7, 1, 2, 23, 1, 2, 7, 1,

28, 2, 1, 1, 1, 2, 1, 3, 1, 4, 3, 2, 1, 1, 1, 33, 7, 1, 3, 23, 1, 3, 7, 1,

37, 2, 1, 1, 1, 3, 1, 3, 1, 4, 4, 2, 1, 1, 1, 42, 7, 1, 4, 23, 1, 4, 7, 1,

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55, 2, 1, 1, 1, 5, 1, 3, 1, 4, 6, 2, 1, 1, 1, 60, 7, 1, 6, 23, 1, 6, 7, 1,

64, 2, 1, 1, 1, 6, 1, 3, 1, 4, 7, 2, 1, 1, 1, ...

$$\beta = \alpha$$

$$\beta\beta = \cfrac{2}{1+\cfrac{3}{2+\cfrac{4}{3+\cfrac{5}{4+\cfrac{6}{5+\cfrac{7}{6+\cfrac{8}{7+\cfrac{9}{8+\cdots}}}}}}}} = 1 = \frac{1}{1} = \frac{\lambda_2}{\mu_2} \quad *)$$

$$\beta\beta\beta = \cfrac{3}{1+\cfrac{4}{2+\cfrac{5}{3+\cfrac{6}{4+\cfrac{7}{5+\cfrac{8}{6+\cfrac{9}{7+\cfrac{10}{8+\cdots}}}}}}}} = \frac{4}{3} = \frac{\lambda_3}{\mu_3}$$

$$\beta\beta\beta\beta = \cfrac{4}{1+\cfrac{5}{2+\cfrac{6}{3+\cfrac{7}{4+\cfrac{8}{5+\cfrac{9}{6+\cfrac{10}{7+\cfrac{11}{8+\cdots}}}}}}}} = \frac{21}{13} = \frac{\lambda_4}{\mu_4}$$

$$\beta\beta\beta\beta\beta = \cfrac{5}{1+\cfrac{6}{2+\cfrac{7}{3+\cfrac{8}{4+\cfrac{9}{5+\cfrac{10}{6+\cfrac{11}{7+\cfrac{12}{8+\cdots}}}}}}}} = \frac{136}{73} = \frac{\lambda_5}{\mu_5}$$

$$\beta\beta\beta\beta\beta\beta = \cfrac{6}{1+\cfrac{7}{2+\cfrac{8}{3+\cfrac{9}{4+\cfrac{10}{5+\cfrac{11}{6+\cfrac{12}{7+\cfrac{13}{8+\cdots}}}}}}}} = \frac{1045}{501} = \frac{\lambda_6}{\mu_6}$$

$$\begin{pmatrix}\lambda_{n+1}\\ \mu_{n+1}\end{pmatrix} = \begin{pmatrix} n & n\\ 1 & n\end{pmatrix}\begin{pmatrix}\lambda_n\\ \mu_n\end{pmatrix}; \begin{pmatrix}\lambda_2\\ \mu_2\end{pmatrix} = \begin{pmatrix}1\\ 1\end{pmatrix}$$

Teil 2, Folge der ungeraden Zahlen

$$C = \cfrac{1}{3+\cfrac{5}{7+\cfrac{9}{11+\cfrac{13}{15+\cfrac{17}{19+\cfrac{21}{23+\cfrac{25}{27+\cfrac{29}{31+\cfrac{33}{35+\cdots}}}}}}}}} = 0.274407784\ldots$$

$$= [0;3,1,1,1,4,3,1,1,4,4,2,2,1,1,2,\ldots] = ?$$

$$\gamma = \cfrac{1}{3+\cfrac{3}{5+\cfrac{5}{7+\cfrac{7}{9+\cfrac{9}{11+\cfrac{11}{13+\cfrac{13}{15+\cfrac{15}{17+\cfrac{17}{19+\cfrac{19}{21+\cdots}}}}}}}}}} = 0.283192341\ldots$$

$$= [0;3,1,1,7,1,1,11,1,1,15,1,1,\ldots] = ??$$

$$D = \cfrac{3}{1+\cfrac{7}{5+\cfrac{11}{9+\cfrac{15}{13+\cfrac{19}{17+\cfrac{23}{21+\cfrac{27}{25+\cfrac{31}{29+\cfrac{35}{33+\cfrac{39}{37+\cdots}}}}}}}}}} = 1.39604504\ldots$$

$$= [1;2,1,1,9,1,1,17,1,1,25,1,1,33,\ldots] = ???$$

7 8 8 8

$$\delta = \cfrac{3}{1+\cfrac{5}{3+\cfrac{7}{5+\cfrac{9}{7+\cfrac{11}{9+\cfrac{13}{11+\cfrac{15}{13+\cfrac{17}{15+\cfrac{19}{17+\cfrac{21}{19+\cdots}}}}}}}}}}} =$$

= 1.359801999554587256…

= [1;2,1,3,1,1,7,1,1,11,1,1,15,1,1,19,…] = ??

$\frac{1}{\delta-1} - \frac{1}{\gamma+1} = 2$

Teil 3, Folge der geraden Zahlen

$$E = \cfrac{2}{4+\cfrac{6}{8+\cfrac{10}{12+\cfrac{14}{16+\cfrac{18}{20+\cfrac{22}{24+\cfrac{26}{28+\cfrac{30}{32+\cfrac{34}{36+\cdots}}}}}}}}}$$

= 0.427038590216724870861404 7…

= [0;2,2,12,1,1,2,126,7,4,1,122,1,2,1,34,2,3,1,7,3,1…]

= ?

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*) Lateral

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**) Gesucht: Transformationsalgorithmus
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Vgl. hierzu
file:///C:/Users/Stoscheck/Documents/Desktop/Notausgang.star/inftreff/modul16/task16.htm

08.01.2023 EPScoll&alg DScalc
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