Unit 15, part 48

Aphorisms, advices, anecdotes, brain teasers, curious stories, epigrams, epigraphs, epitaphs, ideas, crazy-creative ideas, koans, memorabilia, mottos, poems, proverbs, quotations, riddles, sayings, slogans, scurrilities, besun, etc.
collected for encouragement and the advantage of my students and myself.

Wort-Fundstücke, Gehörtes, Gelesenes, Zugelaufenes, …

Systematische Suche nach pflanzlichen Kreativitätskatalysatoren.

The 1 Mio Euro “Göde Prize for Gravity Research” is waiting for you.
http://www.goede-stiftung.org/en/goede-award/

… an seinen Schwachstellen packen.

Genomic engineering, prediction, SETI

A surprising approximation

$$e^{\pi} = \underline{23.140692632779269005729}08...$$

$$23+\frac{1}{6}*\frac{\frac{1}{6}+\frac{1}{7}}{\frac{1}{5}+\frac{1}{6}} = \underline{23.1\overline{406926}}$$

$$e^{\pi} \approx 23+\frac{1}{6}*\frac{5\|6}{6\|7}$$

Dance around this approximation.

Supplements to
"The simple continued fraction (scf) representation of $r \in \mathbb{R}_+$ and modified versions (m…scf)"

S1 Prime sequence
[[3;5,7,11,13,17,19,23,29,31,37,…]] =
3.530176989721365539402421355636881805 0...

S2 e-world

$$\text{scf}\left(\frac{e-2}{3-e}\right) = [2;\underline{1,1,4},\underline{1,1,6},\underline{1,1,8},\underline{1,1,10},...]$$

$$\text{mscf}\left(\frac{e-2}{3-e}\right) = [[2;3,4,5,6,7,8,9,...]]$$

$$\mathrm{scf}\left(2*\frac{e-2}{3-e}\right)=[5;10,14,18,22,26,30,\ldots]$$

$$\mathrm{mscf}\left(2*\frac{e-2}{3-e}\right)=[[5;5*10,10*14,14*18,18*22,\ldots]]$$

$$\mathrm{scf}\left(\frac{1}{2}*\frac{e-2}{3-e}\right)=$$

[[1; 3, 1, 1, 1, 3,
3, 3, 1, 3, 1, 3, 5, 3, 1, 5, 1, 3, 7, 3, 1, 7, 1, 3, 9, 3, 1, 9, 1, 3,
11, 3, 1, 11, 1, 3, 13, 3, 1, 13, 1, 3, 15, 3, 1, 15, 1, 3, 17, 3, 1, 17, 1, 3,
19, 3, 1, 19, 1, 3, 21, 3, 1, 21, 1, 3, 23, 3, 1, 23, 1, 3, 25, 3, 1, 25, 1, 3,
27, 3, 1, 27, 1, 3, 29, 3, 1, 29, 1, 3, 31, 3, 1, 31, 1, 3, 33, 3, 1, 33, 1, 3,
35, 3, 1, 35, 1, 3, 37, 3, 1, 37, 1, 3, 39, 3, 1, 39, 1, 3, 41, 3, 1, 41, 1, 3,
43, 3, 1, 43, 1, 3, 45, 3, 1, 45, 1, 3, 47, 3, 1, 47, 1, 3, 49, 3, 1, 49, 1, 3,
51, 3, 1, 51, 1, 3, 53, 3, 1, 53, 1, 3, 55, 3, 1, 55, 1, 3, 57, 3, 1, 57, 1, 3,
59, 3, 1, 59, 1, 3, 61, 3, 1, 61, 1, 3, 63, 3, 1, 63, 1, 3, 65, 3, 1, 65, 1, 3,...]]

$$\mathrm{mscf}\left(\frac{1}{2}*\frac{e-2}{3-e}\right)=[[1;3,4,5,6,7,8,9,\ldots]]$$

$$\mathrm{mscf}\left(2*\frac{e-2}{3-e}\right)=[[5;5*10,10*14,14*18,18*22,\ldots]]$$

$$\mathrm{scf}\left(\frac{1}{\sqrt{e}-1}\right)=[1;\underline{1,1,5},\underline{1,1,9},\underline{1,1,13},\underline{1,1,17},\ldots]$$

$$\mathrm{mscf}\left(\frac{1}{\sqrt{e}-1}\right)=[[1;1,5,9,17,109,\ldots]]$$

$$\operatorname{scf}\left(\frac{2}{\sqrt{e}-1}\right)=[3;12,20,28,36,44,\ldots]$$

$$\operatorname{mscf}\left(\frac{2}{\sqrt{e}-1}\right)=[[3;3*12,12*20,20*28,28*36,\ldots]]$$

$$\operatorname{scf}\left(\frac{\sqrt{e}-\frac{1}{2}}{\sqrt{e}-1}\right)=[1;\underline{1,3,2},\underline{1,3,4},\underline{1,3,6},\underline{1,3,8},\ldots]$$

$$\operatorname{mscf}\left(\frac{\sqrt{e}-\frac{1}{2}}{\sqrt{e}-1}\right)=[[1;1,3,8,27,32,74,213,389,$$

$$2967,3522,10176,15513,\ldots]]$$

$$\operatorname{scf}\left(\frac{\sqrt{e}-1}{\sqrt{e}-\frac{3}{2}}\right)=[4;2,\underline{1,3,4},\underline{1,3,6},\underline{1,3,8},\underline{1,3,10},\ldots]$$

$$\operatorname{mscf}\left(\frac{\sqrt{e}-1}{\sqrt{e}-\frac{3}{2}}\right)=$$

$$[[4;11,11*20,20*28,28*36,36*44,44*52,\ldots]]$$

$$\operatorname{mscf}\left(2*\frac{\sqrt{e}-1}{\sqrt{e}-\frac{3}{2}}\right)=$$

$$[[8;11,11*20,20*28,28*36,36*44,44*52,\ldots]]$$

Find more; find generalizations.

S3

Control calculations by Dr. Dagmar Schönfeld with Mathematica®

In[227]:=
```
ContinuedFraction[N[1 / (E - 2), 100]]
```

Out[227]=
```
{1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1,
 1, 16, 1, 1, 18, 1, 1, 20, 1, 1, 22, 1, 1, 24, 1, 1, 26, 1, 1, 28, 1,
 1, 30, 1, 1, 32, 1, 1, 34, 1, 1, 36, 1, 1, 38, 1, 1, 40, 1, 1, 42, 1, 1,
 44, 1, 1, 46, 1, 1, 48, 1, 1, 50, 1, 1, 52, 1, 1, 54, 1, 1, 56, 1, 1, 58}
```

In[238]:=
```
x = N[1 / (E - 2), 200]; anz = 100; mA = Table[0, {i, anz}];
mA[[1]] = IntegerPart[x]; i = 1;
While[x ≠ IntegerPart[x] && i ≠ anz,
 {x = mA[[i]] / (x - mA[[i]]); i++; mA[[i]] = IntegerPart[x];}]; Print[mA];
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,
 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61,
 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}
```

In[247]:=
```
a = 2; Print[N[Sqrt[a^2 + 1], 50]]; ContinuedFraction[N[Sqrt[a^2 + 1], 50]]
```

```
2.2360679774997896964091736687312762354406183596115
```

Out[247]=
```
{2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}
```

In[245]:=
```
a = 2; x = N[Sqrt[a^2 + 1], 200]; anz = 50;
mA = Table[0, {i, anz}]; mA[[1]] = IntegerPart[x]; i = 1;
While[x ≠ IntegerPart[x] && i ≠ anz,
 {x = mA[[i]] / (x - mA[[i]]); i++; mA[[i]] = IntegerPart[x];}]; Print[mA];
```

```
{2, 8, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16}
```

In[254]:=
```
a = 30; Print[N[Sqrt[a^2 + 1], 50]]; ContinuedFraction[N[Sqrt[a^2 + 1], 50]]
```

```
30.016662039607268763449850971101478792001788886131
```

Out[254]=
```
{30, 60, 60, 60, 60, 60, 60, 60, 60, 60, 60, 60, 60, 60}
```

In[255]:=
```
a = 30; x = N[Sqrt[a^2 + 1], 200]; anz = 50;
mA = Table[0, {i, anz}]; mA[[1]] = IntegerPart[x]; i = 1;
While[x ≠ IntegerPart[x] && i ≠ anz,
 {x = mA[[i]]/(x - mA[[i]]); i++; mA[[i]] = IntegerPart[x];}]; Print[mA];
```

```
{30, 1800, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600,
 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600,
 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600,
 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600, 3600}
```

--> funktioniert nicht für reelle a - Werte

In[260]:=
```
Print[N[1/2 (1 + Sqrt[5]), 50]]; ContinuedFraction[N[1/2 (1 + Sqrt[5]), 30]]
```

```
1.6180339887498948482045868343656381177203091798058
```

Out[260]=
```
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}
```

In[261]:=
```
x = N[1/2 (1 + Sqrt[5]), 200]; anz = 30;
mA = Table[0, {i, anz}]; mA[[1]] = IntegerPart[x]; i = 1;
While[x ≠ IntegerPart[x] && i ≠ anz,
 {x = mA[[i]]/(x - mA[[i]]); i++; mA[[i]] = IntegerPart[x];}]; Print[mA];
```

```
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}
```

In[263]:=
```
Print[N[Sqrt[5], 50]]; ContinuedFraction[N[Sqrt[5], 30]]
```

```
2.2360679774997896964091736687312762354406183596115
```

Out[263]=
```
{2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}
```

In[264]:=
```
x = N[Sqrt[5], 200]; anz = 30; mA = Table[0, {i, anz}]; mA[[1]] = IntegerPart[x]; i = 1;
While[x ≠ IntegerPart[x] && i ≠ anz,
 {x = mA[[i]]/(x - mA[[i]]); i++; mA[[i]] = IntegerPart[x];}]; Print[mA];
```

```
{2, 8, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16}
```

In[271]:=
```
Table[{Print["i=", i, " Sqrt[i]=", N[Sqrt[i], 20]];
   Print[ContinuedFraction[N[Sqrt[i], 30]]];}, {i, 2, 20}];
```

```
i=2 √i =1.4142135623730950488

{1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2}

i=3 √i =1.7320508075688772935

{1, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2,
 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1}

i=4 √i =2.0000000000000000000

ContinuedFraction::start： Warning: ContinuedFraction was unable to obtain at least one term using precision 30.`. ≫

ContinuedFraction[2.0000000000000000000000000000]

i=5 √i =2.2360679774997896964

{2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}

i=6 √i =2.4494897427831780982

{2, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4, 2, 4}

i=7 √i =2.6457513110645905905

{2, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1,
 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1, 1, 1, 4, 1}

i=8 √i =2.8284271247461900976

{2, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1,
 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1, 4, 1}

i=9 √i =3.0000000000000000000

ContinuedFraction::start： Warning: ContinuedFraction was unable to obtain at least one term using precision 30.`. ≫

ContinuedFraction[3.0000000000000000000000000000]

i=10 √i =3.1622776601683793320

{3, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6}

i=11 √i =3.3166247903553998491

{3, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6, 3, 6}

i=12 √i =3.4641016151377545871

{3, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6, 2, 6}

i=13 √i =3.6055512754639892931

{3, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1,
 1, 1, 6, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1, 1, 1, 6, 1, 1}

i=14 √i =3.7416573867739413856

{3, 1, 2, 1, 6, 1, 2, 1, 6, 1, 2, 1, 6, 1, 2, 1, 6, 1,
 2, 1, 6, 1, 2, 1, 6, 1, 2, 1, 6, 1, 2, 1, 6, 1, 2, 1, 6, 1, 2, 1}

i=15 √i =3.8729833462074168852

{3, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1, 6, 1}

i=16 √i =4.0000000000000000000

ContinuedFraction::start： Warning: ContinuedFraction was unable to obtain at least one term using precision 30.`. ≫

General::stop： Further output of ContinuedFraction::start will be suppressed during this calculation. ≫
```

```
ContinuedFraction[4.0000000000000000000000000000]
```

```
i=17 √i =4.1231056256176605498
{4, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8}

i=18 √i =4.2426406871192851464
{4, 4, 8, 4, 8, 4, 8, 4, 8, 4, 8, 4, 8, 4, 8, 4, 8, 4, 8, 4}

i=19 √i =4.3588989435406735522
{4, 2, 1, 3, 1, 2, 8, 2, 1, 3, 1, 2, 8, 2, 1, 3,
 1, 2, 8, 2, 1, 3, 1, 2, 8, 2, 1, 3, 1, 2, 8, 2, 1, 3, 1, 2}

i=20 √i =4.4721359549995793928
{4, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2, 8, 2}
```

In[274]:=
```
anz = 30; mA = Table[0, {i, anz}];
Table[{Print["i=", i, " √i =", N[√i, 20]];
   x = N[√i, 300]; mA[[1]] = IntegerPart[x]; j = 1;
   While[x ≠ IntegerPart[x] && j ≠ anz,
    {x = mA[[j]]/(x - mA[[j]]); j++; mA[[j]] = IntegerPart[x];}]; Print[mA];}, {i, 2, 20}];
```

```
i=2 √i =1.4142135623730950488
{1, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}

i=3 √i =1.7320508075688772935
{1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2}

i=4 √i =2.0000000000000000000
{2, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2}

i=5 √i =2.2360679774997896964
{2, 8, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16}

i=6 √i =2.4494897427831780982
{2, 4, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8}

i=7 √i =2.6457513110645905905
{2, 3, 30, 34, 111, 235, 3775, 5052, 7352, 9091, 34 991, 35 530, 53 424, 57 290, 66 023,
 1 409 179, 1 519 111, 1 725 990, 1 812 396, 4 370 835, 4 507 156, 4 655 396, 44 257 080,
 234 755 198, 261 519 946, 264 374 278, 273 487 975, 3 189 311 031, 7 059 454 273, 7 723 669 370}

i=8 √i =2.8284271247461900976
{2, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}

i=9 √i =3.0000000000000000000
{3, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4}

i=10 √i =3.1622776601683793320
{3, 18, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36,
 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36}

i=11 √i =3.3166247903553998491
{3, 9, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18,
 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18}
```

i=12 $\sqrt{i}$ =3.4641016151377545871

{3, 6, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,
 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12}

i=13 $\sqrt{i}$ =3.6055512754639892931

{3, 4, 4, 20, 24, 48, 49, 53, 308, 1409, 2125, 4959, 26 653, 117 335, 24 145 119,
 390 578 897, 805 513 046, 820 068 070, 848 961 225, 4 243 255 752, 4 726 318 736,
 94 634 110 141, 3 438 501 651 676, 14 710 363 311 953, 45 415 690 117 678, 84 500 934 125 639,
 96 418 289 983 027, 162 365 779 250 736, 382 585 883 211 698, 1 015 358 801 707 859}

i=14 $\sqrt{i}$ =3.7416573867739413856

{3, 4, 88, 97, 122, 151, 196, 692, 2 364 186, 5 959 182, 12 669 806, 537 850 415,
 809 424 524, 1 390 955 391, 50 172 248 639, 116 976 079 942, 1 107 144 611 533,
 1 726 578 602 027, 5 722 950 315 500, 8 352 504 605 810, 8 757 734 058 755, 18 014 892 536 721,
 76 281 558 417 169, 305 281 261 855 103, 512 352 412 405 138, 703 449 404 499 090,
 2 627 568 221 450 456, 10 365 080 381 947 413, 17 265 827 315 918 210, 66 123 858 558 661 767}

i=15 $\sqrt{i}$ =3.8729833462074168852

{3, 3, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6}

i=16 $\sqrt{i}$ =4.0000000000000000000

{4, 3, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6}

i=17 $\sqrt{i}$ =4.1231056256176605498

{4, 32, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64,
 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64}

i=18 $\sqrt{i}$ =4.2426406871192851464

{4, 16, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32,
 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32}

i=19 $\sqrt{i}$ =4.3588989435406735522

{4, 11, 75, 98, 108, 269, 890, 1533, 4249, 5108, 5638, 10 283, 11 581, 16 326, 52 133, 59 027,
 68 220, 527 572, 4 844 161, 7 214 622, 99 470 808, 181 372 123, 311 346 415, 678 855 562,
 1 267 486 517, 3 912 640 497, 5 345 797 292, 26 101 020 990, 381 187 738 076, 649 089 880 427}

i=20 $\sqrt{i}$ =4.4721359549995793928

{4, 8, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16}

S4 Problems

** Discuss other scf(r)-modifications
(transformation algorithms, examples, explorativity, applications)
f.i.

$$m''scf(r) = \alpha_0 + \cfrac{\alpha_0^k}{\alpha_1 + \cfrac{\alpha_1^k}{\alpha_2 + \cfrac{\alpha_2^k}{\alpha_3 + \cfrac{\alpha_3^k}{\alpha_4 + \ddots \cfrac{\alpha_{n-1}^k}{\alpha_n}}}}} \quad ;$$

$$k \in \mathbb{Q}_+$$

** The recurrence equations

loop body (scf) = "x := $\dfrac{1}{frac(x)}$"

and

loop body (mscf) = "x := $\dfrac{int(x)}{frac(x)}$"

resp., form the main parts of the
considered transformations.
Discuss other loop bodies.
Hints

$$x := \frac{1}{(\mathrm{frac}(x))^{n}} ;$$

$$x := \frac{x^{m}}{(\mathrm{frac}(x))^{n}} ;$$

$$x := \frac{(\mathrm{int}(x))^{m}}{(\mathrm{frac}(x))^{n}} ; \ldots$$

$$\mathrm{frac}(x) = x - \mathrm{int}(x) \quad [1,2] ; \quad m,n \in \mathbb{Q}_{+}$$

References

[1] Weisstein, Eric W. "Integer Part." From *MathWorld*--A Wolfram Web Resource. http://mathworld.wolfram.com/IntegerPart.html

[2] http://math.feld.cvut.cz/mt/txtb/4/txe3ba4m.htm

02.08.2017 EPSnoct. DScalc.