Unit 15, part 71, appendix 1

DS’s 16.05.2018 experimental material using Mathematica®

In[11]:=
```
anz = 10; genau = 40;(*p=2;q=0;*)
Table[{p = j; Table[{q = k; Print["p=", p, ",  q=", q, ":"];
    f = Table[0, {i, anz}]; i = 1; matrix = {{p i - q, p i - (q + 1)},
      {p i - (q + 1), p i - (q + 2)}}; Print[TableForm[matrix]];
    If[matrix[[2, 2]] ≠ 0,
     f[[1]] =
      1/2 (matrix[[1, 1]] / matrix[[2, 1]] + matrix[[1, 2]] / matrix[[2, 2]])];
    Print["i=", i, ": ", ContinuedFraction[f[[i]],
      Length[ContinuedFraction[f[[i]]]]];
    Table[{matrix = matrix.{{p i - q, p i - (q + 1)}, {p i - (q + 1), p i - (q + 2)}};
      f[[i]] =
       1/2 (matrix[[1, 1]] / matrix[[2, 1]] + matrix[[1, 2]] / matrix[[2, 2]]);
      If[i == 2, Print[TableForm[matrix]]]; Print["i=", i, ": ",
       ContinuedFraction[f[[i]], Length[ContinuedFraction[f[[i]]]]];
     }, {i, 2, anz}]; Print[N[f, genau]];
   }, {k, 0, 3}];}, {j, 2, 5}];
```

```
p=2,  q=0:

2   1
1   0

i=1: {0}

11   8
4    3

i=2: {2, 1, 2, 2, 3}

i=3: {2, 1, 2, 1, 1, 4, 2, 4, 1, 1, 3}

i=4: {2, 1, 2, 1, 1, 4, 1, 1, 6, 2, 6, 1, 1, 4, 1, 1, 3}

i=5: {2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 2, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

i=6: {2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 2, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

i=7: {2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1,
  10, 1, 1, 12, 2, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

i=8: {2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12,
  1, 1, 14, 2, 14, 1, 1, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

i=9: {2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1,
  1, 16, 2, 16, 1, 1, 14, 1, 1, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

i=10: {2, 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,
  2, 18, 1, 1, 16, 1, 1, 14, 1, 1, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 3}

{0, 2.708333333333333333333333333333333333333,
 2.718349358974358974358974358974358974359, 2.718281575991012678542770020863424811427,
 2.718281829074971110627169155370872841635, 2.718281828457992519906427002567336492265,
 2.718281828459046563640797568837577969446, 2.718281828459045234073389392656677769241,
 2.718281828459045235361274452780058451485, 2.718281828459045235360286857426149332444}

p=2,  q=1:

1   0
0   -1
```

Power::infy : Infinite expression $\frac{1}{0}$ encountered. ≫

```
i=1: ContinuedFraction[ComplexInfinity, 1]

3     2
-2    -1

i=2: {-1, -1, -3}

i=3: {-1, -1, -1, -1, -3, -2, -3, -1, -2}

i=4: {-1, -1, -1, -1, -3, -1, -1, -5, -2, -5, -1, -1, -3, -1, -2}

i=5: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7, -2, -7, -1, -1, -5, -1, -1, -3, -1, -2}

i=6: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7,
  -1, -1, -9, -2, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3, -1, -2}

i=7: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1,
  -1, -11, -2, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3, -1, -2}

i=8: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1, -1, -11, -1, -1, -13,
  -2, -13, -1, -1, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3, -1, -2}

i=9: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7, -1,
  -1, -9, -1, -1, -11, -1, -1, -13, -1, -1, -15, -2, -15, -1, -1, -13,
  -1, -1, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3, -1, -2}

i=10: {-1, -1, -1, -1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1, -1,
  -11, -1, -1, -13, -1, -1, -15, -1, -1, -17, -2, -17, -1, -1, -15, -1, -1,
  -13, -1, -1, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3, -1, -2}

{ComplexInfinity, -1.75000000000000000000000000000000000000,
 -1.63961038961038961038961038961038961390,
 -1.64026583611159852605720301807334620108 8,
 -1.64026266660804453478265280296568237853,
 -1.64026267607399784610176553457471032 3671,
 -1.64026267605482536213891697601240186 3622,
 -1.64026267605485334986268400039936350 9763,
 -1.64026267605485331905794409958592168 0105,
 -1.64026267605485331908440404071448919 4982}

p=2,  q=2:

0     -1
-1    -2

i=1: {0, 4}

-1    0
-4    -1

i=2: {0, 8}

i=3: {0, 4, 1, 2, 2, 2, 1, 4}

i=4: {0, 4, 1, 2, 1, 1, 4, 2, 4, 1, 1, 2, 1, 4}

i=5: {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 2, 6, 1, 1, 4, 1, 1, 2, 1, 4}

i=6: {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 2, 8, 1, 1, 6, 1, 1, 4, 1, 1, 2, 1, 4}

i=7:
 {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 2, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 2, 1, 4}

i=8: {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10,
  1, 1, 12, 2, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 2, 1, 4}

i=9: {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1,
  1, 14, 2, 14, 1, 1, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 2, 1, 4}
```

```
i=10: {0, 4, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1, 1,
  16, 2, 16, 1, 1, 14, 1, 1, 12, 1, 1, 10, 1, 1, 8, 1, 1, 6, 1, 1, 4, 1, 1, 2, 1, 4}
```

```
{0.25000000000000000000000000000000000000,
 0.12500000000000000000000000000000000000,
 0.21240601503759398496240601503759398496 24,
 0.21193852577022746904693348689893463864 09,
 0.21194156895779243365835073403757975397 87,
 0.21194155758941853316917599577250637440 86,
 0.21194155761713273223195927181433054929 36,
 0.21194155761708538540551097595665911027 25,
 0.21194155761708544512864700104359639734 92,
 0.21194155761708544507079620374108161301 88}
```

```
p=2,  q=3:
```

```
-1   -2
-2   -3
```

```
i=1: {0, 1, 1, 2, 2}
```

```
-1   2
-2   3
```

```
i=2: {0, 1, 1, 2, 2}
```

Power::infy : Infinite expression $\frac{1}{0}$ encountered. ≫

```
i=3: ContinuedFraction[ComplexInfinity, 1]
```

```
i=4: {-1, -3, -2, -3}
```

```
i=5: {-1, -3, -1, -1, -5, -2, -5, -1, -1, -3}
```

```
i=6: {-1, -3, -1, -1, -5, -1, -1, -7, -2, -7, -1, -1, -5, -1, -1, -3}
```

```
i=7:
 {-1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -2, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3}
```

```
i=8: {-1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1,
  -1, -11, -2, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3}
```

```
i=9: {-1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1, -1, -11, -1, -1,
  -13, -2, -13, -1, -1, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3}
```

```
i=10: {-1, -3, -1, -1, -5, -1, -1, -7, -1, -1, -9, -1, -1, -11, -1, -1, -13, -1, -1, -15,
  -2, -15, -1, -1, -13, -1, -1, -11, -1, -1, -9, -1, -1, -7, -1, -1, -5, -1, -1, -3}
```

```
{0.58333333333333333333333333333333333333,
 0.58333333333333333333333333333333333333, ComplexInfinity,
 -1.29166666666666666666666666666666666667,
 -1.28232998885172798216276477146042363433 7,
 -1.28237022042865185681807437586759668733 9,
 -1.28237010014059942926386178813155196507 3,
 -1.28237010038423132452469667069125029626 9,
 -1.28237010038387567408778130889198626513 5,
 -1.28237010038387606553509212333241205302 4}
```

```
p=3,  q=0:
```

```
3   2
2   1
```

```
i=1: {1, 1, 3}
```

```
28   23
17   14
```

```
i=2: {1, 1, 1, 1, 4, 2, 4, 1, 2}
```

```
i=3: {1, 1, 1, 1, 4, 1, 1, 7, 2, 7, 1, 1, 4, 1, 2}

i=4: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 2, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=5: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 2, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=6: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1,
  13, 1, 1, 16, 2, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=7: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16,
  1, 1, 19, 2, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=8: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16, 1, 1, 19, 1,
  1, 22, 2, 22, 1, 1, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=9: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16, 1, 1, 19, 1, 1, 22, 1, 1,
  25, 2, 25, 1, 1, 22, 1, 1, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

i=10: {1, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16, 1, 1, 19, 1, 1, 22, 1, 1, 25, 1, 1,
  28, 2, 28, 1, 1, 25, 1, 1, 22, 1, 1, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 2}

{1.75000000000000000000000000000000000000, 1.64495798319327731092436974789915966386 6,
 1.64529108208353491372359296887598774391 2, 1.64529021634558940010126575580401272998 5,
 1.64529021768425451895176462248077195189 8, 1.64529021768288852254270650146891215137 4,
 1.64529021768288950785187747670682032126 3, 1.64529021768288950732364143772582573987 3,
 1.64529021768288950732386003199314168124 0, 1.64529021768288950732385996008571668132 0}

p=3,  q=1:

2   1
1   0

i=1: {0}

14   11
5    4

i=2: {2, 1, 3, 2, 4}

i=3: {2, 1, 3, 1, 1, 6, 2, 6, 1, 1, 4}

i=4: {2, 1, 3, 1, 1, 6, 1, 1, 9, 2, 9, 1, 1, 6, 1, 1, 4}

i=5: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 2, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

i=6: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 1, 1, 15, 2, 15, 1, 1, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

i=7: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 1, 1,
  15, 1, 1, 18, 2, 18, 1, 1, 15, 1, 1, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

i=8: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 1, 1, 15, 1, 1, 18,
  1, 1, 21, 2, 21, 1, 1, 18, 1, 1, 15, 1, 1, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

i=9: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 1, 1, 15, 1, 1, 18, 1, 1, 21, 1,
  1, 24, 2, 24, 1, 1, 21, 1, 1, 18, 1, 1, 15, 1, 1, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

i=10: {2, 1, 3, 1, 1, 6, 1, 1, 9, 1, 1, 12, 1, 1, 15, 1, 1, 18, 1, 1, 21, 1, 1, 24, 1, 1, 27,
  2, 27, 1, 1, 24, 1, 1, 21, 1, 1, 18, 1, 1, 15, 1, 1, 12, 1, 1, 9, 1, 1, 6, 1, 1, 4}

{0, 2.77500000000000000000000000000000000000,
 2.77953639082751744765702891326021934197 4, 2.77952136555910629888700859954650877173 5,
 2.77952139276754797863096845101868774950 3, 2.77952139273593711128360369264006965854 2,
 2.77952139273596254590955435096486015008 6, 2.77952139273596253092685236270058030687 8,
 2.77952139273596253093358693689140624432 5, 2.77952139273596253093358455222380728642 0}

p=3,  q=2:

1   0
0   -1

Power::infy : Infinite expression 1/0 encountered. ≫
```

General::stop : Further output of Power::infy will be suppressed during this calculation. ≫

```
i=1: ContinuedFraction[ComplexInfinity, 1]

4     3
-3    -2

i=2: {-1, -2, -2, -2}

i=3: {-1, -2, -1, -1, -5, -2, -5, -1, -1, -2}

i=4: {-1, -2, -1, -1, -5, -1, -1, -8, -2, -8, -1, -1, -5, -1, -1, -2}

i=5: {-1, -2, -1, -1, -5, -1, -1, -8,
  -1, -1, -11, -2, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

i=6: {-1, -2, -1, -1, -5, -1, -1, -8, -1, -1, -11, -1,
  -1, -14, -2, -14, -1, -1, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

i=7: {-1, -2, -1, -1, -5, -1, -1, -8, -1, -1, -11, -1, -1, -14, -1, -1,
  -17, -2, -17, -1, -1, -14, -1, -1, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

i=8: {-1, -2, -1, -1, -5, -1, -1, -8, -1, -1, -11, -1, -1, -14, -1, -1, -17, -1, -1, -20,
  -2, -20, -1, -1, -17, -1, -1, -14, -1, -1, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

i=9: {-1, -2, -1, -1, -5, -1, -1, -8, -1, -1, -11, -1, -1,
  -14, -1, -1, -17, -1, -1, -20, -1, -1, -23, -2, -23, -1, -1, -20, -1,
  -1, -17, -1, -1, -14, -1, -1, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

i=10: {-1, -2, -1, -1, -5, -1, -1, -8, -1, -1, -11, -1, -1, -14, -1, -1, -17,
  -1, -1, -20, -1, -1, -23, -1, -1, -26, -2, -26, -1, -1, -23, -1, -1, -20,
  -1, -1, -17, -1, -1, -14, -1, -1, -11, -1, -1, -8, -1, -1, -5, -1, -1, -2}

{ComplexInfinity, -1.41666666666666666666666666666666666667,
 -1.39339826839826839826839826839826839826,
 -1.39347243933487675696354486152060206713 2,
 -1.39347227968420657810567772594768448455 8,
 -1.39347227989718089879407171817889507037 1,
 -1.39347227989698857348647867181843834485 4,
 -1.39347227989698869853892958722978990531 9,
 -1.39347227989698869847765935527094080813 3,
 -1.39347227989698869847768277388446127844 1}

p=3,  q=3:

0     -1
-1    -2

i=1: {0, 4}

-2    -1
-7    -4

i=2: {0, 3, 1, 2, 1, 3}

i=3: {0, 3, 1, 1, 1, 4, 2, 4, 1, 1, 1, 3}

i=4: {0, 3, 1, 1, 1, 4, 1, 1, 7, 2, 7, 1, 1, 4, 1, 1, 1, 3}

i=5: {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 2, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}

i=6:
 {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 2, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}

i=7: {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13,
  1, 1, 16, 2, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}

i=8: {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16,
  1, 1, 19, 2, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}

i=9: {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16, 1, 1, 19, 1, 1,
  22, 2, 22, 1, 1, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}
```

```
i=10: {0, 3, 1, 1, 1, 4, 1, 1, 7, 1, 1, 10, 1, 1, 13, 1, 1, 16, 1, 1, 19, 1, 1, 22, 1, 1, 25,
  2, 25, 1, 1, 22, 1, 1, 19, 1, 1, 16, 1, 1, 13, 1, 1, 10, 1, 1, 7, 1, 1, 4, 1, 1, 1, 3}

{0.250000000000000000000000000000000000000,
 0.267857142857142857142
```

```
i=6: {1, 1, 1, 1, 5, 1, 1, 9, 1, 1, 13, 1, 1,
  17, 1, 1, 21, 2, 21, 1, 1, 17, 1, 1, 13, 1, 1, 9, 1, 1, 5, 1, 2}

i=7: {1, 1, 1, 1, 5, 1, 1, 9, 1, 1, 13, 1, 1, 17, 1, 1, 21,
  1, 1, 25, 2, 25, 1, 1, 21, 1, 1, 17, 1, 1, 13, 1, 1, 9, 1, 1, 5, 1, 2}

i=8: {1, 1, 1, 1, 5, 1, 1, 9, 1, 1, 13, 1, 1, 17, 1, 1, 21, 1, 1, 25, 1,
  1, 29, 2, 29, 1, 1, 25, 1, 1, 21, 1, 1, 17, 1, 1, 13, 1, 1, 9, 1, 1, 5, 1, 2}

i=9: {1, 1, 1, 1, 5, 1, 1, 9, 1, 1, 13, 1, 1, 17, 1, 1, 21, 1, 1, 25, 1, 1, 29, 1, 1,
  33, 2, 33, 1, 1, 29, 1, 1, 25, 1, 1, 21, 1, 1, 17, 1, 1, 13, 1, 1, 9, 1, 1, 5, 1, 2}

i=10: {1, 1, 1, 1, 5, 1, 1, 9, 1, 1, 13, 1, 1, 17, 1, 1, 21, 1, 1, 25, 1, 1, 29, 1, 1, 33, 1, 1,
  37, 2, 37, 1, 1, 33, 1, 1, 29, 1, 1, 25, 1, 1, 21, 1, 1, 17, 1, 1, 13, 1, 1, 9, 1, 1, 5, 1, 2}

{1.75000000000000000000000000000000000000, 1.64852941176470588235294117647058823529,
 1.64872158059126897653809835112951260260 0, 1.64872127040806202314367530899924690735 2,
 1.64872127070030712583559895906413453282 1, 1.64872127070012807012790899623079187817 3,
 1.64872127070012814687290700159066161641 6, 1.64872127070012814684864490264220208450 8,
 1.64872127070012814684865078894406204800 0, 1.64872127070012814684865078781398767965 1}

p=4,  q=2:

2   1
1   0

i=1: {0}

17   14
6    5

i=2: {2, 1, 4, 2, 5}

i=3: {2, 1, 4, 1, 1, 8, 2, 8, 1, 1, 5}

i=4: {2, 1, 4, 1, 1, 8, 1, 1, 12, 2, 12, 1, 1, 8, 1, 1, 5}

i=5: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 2, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

i=6: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 1, 1, 20, 2, 20, 1, 1, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

i=7: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 1, 1,
  20, 1, 1, 24, 2, 24, 1, 1, 20, 1, 1, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

i=8: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 1, 1, 20, 1, 1, 24,
  1, 1, 28, 2, 28, 1, 1, 24, 1, 1, 20, 1, 1, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

i=9: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 1, 1, 20, 1, 1, 24, 1, 1, 28, 1, 1,
  32, 2, 32, 1, 1, 28, 1, 1, 24, 1, 1, 20, 1, 1, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

i=10: {2, 1, 4, 1, 1, 8, 1, 1, 12, 1, 1, 16, 1, 1, 20, 1, 1, 24, 1, 1, 28, 1, 1, 32, 1, 1, 36,
  2, 36, 1, 1, 32, 1, 1, 28, 1, 1, 24, 1, 1, 20, 1, 1, 16, 1, 1, 12, 1, 1, 8, 1, 1, 5}

{0, 2.81666666666666666666666666666666666666667,
 2.81909827760891590678824721377912867274 6, 2.81909353619555259928393856438443689880 0,
 2.81909354124241856627499180847516643347 0, 2.81909354123900199309440875306478645810 7,
 2.81909354123900358534287876352807159807 1, 2.81909354123900358480195755602307689859 0,
 2.81909354123900358480209732557772115099 7, 2.81909354123900358480209729719812873604 0}

p=4,  q=3:

1   0
0   -1

i=1: ContinuedFraction[ComplexInfinity, 1]

5    4
-4   -3

i=2: {-1, -3, -2, -3}

i=3: {-1, -3, -1, -1, -7, -2, -7, -1, -1, -3}

i=4: {-1, -3, -1, -1, -7, -1, -1, -11, -2, -11, -1, -1, -7, -1, -1, -3}
```

```
i=5: {-1, -3, -1, -1, -7, -1, -1, -11,
  -1, -1, -15, -2, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

i=6: {-1, -3, -1, -1, -7, -1, -1, -11, -1, -1, -15, -1,
  -1, -19, -2, -19, -1, -1, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

i=7: {-1, -3, -1, -1, -7, -1, -1, -11, -1, -1, -15, -1, -1, -19, -1, -1,
  -23, -2, -23, -1, -1, -19, -1, -1, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

i=8: {-1, -3, -1, -1, -7, -1, -1, -11, -1, -1, -15, -1, -1, -19, -1, -1, -23, -1, -1, -27,
  -2, -27, -1, -1, -23, -1, -1, -19, -1, -1, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

i=9: {-1, -3, -1, -1, -7, -1, -1, -11, -1, -1, -15, -1, -1,
  -19, -1, -1, -23, -1, -1, -27, -1, -1, -31, -2, -31, -1, -1, -27, -1,
  -1, -23, -1, -1, -19, -1, -1, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

i=10: {-1, -3, -1, -1, -7, -1, -1, -11, -1, -1, -15, -1, -1, -19, -1, -1, -23,
  -1, -1, -27, -1, -1, -31, -1, -1, -35, -2, -35, -1, -1, -31, -1, -1, -27,
  -1, -1, -23, -1, -1, -19, -1, -1, -15, -1, -1, -11, -1, -1, -7, -1, -1, -3}

{ComplexInfinity, -1.291666666666666666666666666666666666666667,
 -1.283176100628930817610062893081761006289,
 -1.283192361391139959502408609423711469837,
 -1.283192341677469713434981040887667240965,
 -1.283192341692288025648542453219945626680,
 -1.283192341692280490109459922531624656038,
 -1.283192341692280492867659294259088029074,
 -1.283192341692280492866898709875514967774,
 -1.283192341692280492866898873468561363239}

p=5,  q=0:

5    4
4    3

i=1: {1, 3, 2, 3}

86    77
67    60

i=2: {1, 3, 1, 1, 8, 2, 8, 1, 1, 3}

i=3: {1, 3, 1, 1, 8, 1, 1, 13, 2, 13, 1, 1, 8, 1, 1, 3}

i=4: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 2, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=5: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1, 23, 2, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=6: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1,
  23, 1, 1, 28, 2, 28, 1, 1, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=7: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1, 23, 1, 1, 28,
  1, 1, 33, 2, 33, 1, 1, 28, 1, 1, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=8: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1, 23, 1, 1, 28, 1, 1, 33, 1, 1,
  38, 2, 38, 1, 1, 33, 1, 1, 28, 1, 1, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=9: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1, 23, 1, 1, 28, 1, 1, 33, 1, 1, 38, 1, 1, 43,
  2, 43, 1, 1, 38, 1, 1, 33, 1, 1, 28, 1, 1, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

i=10: {1, 3, 1, 1, 8, 1, 1, 13, 1, 1, 18, 1, 1, 23, 1,
  1, 28, 1, 1, 33, 1, 1, 38, 1, 1, 43, 1, 1, 48, 2, 48, 1, 1, 43, 1, 1,
  38, 1, 1, 33, 1, 1, 28, 1, 1, 23, 1, 1, 18, 1, 1, 13, 1, 1, 8, 1, 1, 3}

{1.291666666666666666666666666666666666666667, 1.283457711442786069651741293532338308458,
 1.283468992431484268276908613090787485290, 1.283468982664027942663592645289245914509,
 1.283468982669161387512793259752876770627, 1.283468982669159590065764083472953797479,
 1.283468982669159590513789494495716645492, 1.283468982669159590513706051706734123808,
 1.283468982669159590513706063752154623381, 1.283468982669159590513706063750767847703}

p=5,  q=1:
```

```
4    3
3    2

i=1: {1, 2, 2, 2}

60    53
43    38

i=2: {1, 2, 1, 1, 7, 2, 7, 1, 1, 2}

i=3: {1, 2, 1, 1, 7, 1, 1, 12, 2, 12, 1, 1, 7, 1, 1, 2}

i=4: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 2, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=5: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1, 22, 2, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=6: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1,
  22, 1, 1, 27, 2, 27, 1, 1, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=7: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1, 22, 1, 1, 27,
  1, 1, 32, 2, 32, 1, 1, 27, 1, 1, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=8: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1, 22, 1, 1, 27, 1, 1, 32, 1, 1,
  37, 2, 37, 1, 1, 32, 1, 1, 27, 1, 1, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=9: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1, 22, 1, 1, 27, 1, 1, 32, 1, 1, 37, 1, 1, 42,
  2, 42, 1, 1, 37, 1, 1, 32, 1, 1, 27, 1, 1, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

i=10: {1, 2, 1, 1, 7, 1, 1, 12, 1, 1, 17, 1, 1, 22, 1,
  1, 27, 1, 1, 32, 1, 1, 37, 1, 1, 42, 1, 1, 47, 2, 47, 1, 1, 42, 1, 1,
  37, 1, 1, 32, 1, 1, 27, 1, 1, 22, 1, 1, 17, 1, 1, 12, 1, 1, 7, 1, 1, 2}

{1.41666666666666666666666666666666666667, 1.39504283965728274173806609547123623011 0,
 1.39507344216317284527704864981482147351 8, 1.39507341245409205302137599081406218698 2,
 1.39507341247119929212597543013626970400 2, 1.39507341247119283419607402562157483671 6,
 1.39507341247119283591150898149383202407 0, 1.39507341247119283591117141132411699295 0,
 1.39507341247119283591117146247357969472 3, 1.39507341247119283591117146246743057350 4}

p=5,  q=2:

3    2
2    1

i=1: {1, 1, 3}

38    33
23    20

i=2: {1, 1, 1, 1, 6, 2, 6, 1, 2}

i=3: {1, 1, 1, 1, 6, 1, 1, 11, 2, 11, 1, 1, 6, 1, 2}

i=4: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 2, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=5: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1, 21, 2, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=6: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1,
  21, 1, 1, 26, 2, 26, 1, 1, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=7: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1, 21, 1, 1, 26,
  1, 1, 31, 2, 31, 1, 1, 26, 1, 1, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=8: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1, 21, 1, 1, 26, 1, 1, 31, 1,
  1, 36, 2, 36, 1, 1, 31, 1, 1, 26, 1, 1, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=9: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1, 21, 1, 1, 26, 1, 1, 31, 1, 1, 36, 1, 1, 41,
  2, 41, 1, 1, 36, 1, 1, 31, 1, 1, 26, 1, 1, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}

i=10: {1, 1, 1, 1, 6, 1, 1, 11, 1, 1, 16, 1, 1, 21, 1, 1, 26, 1, 1, 31, 1, 1, 36, 1, 1, 41, 1, 1,
  46, 2, 46, 1, 1, 41, 1, 1, 36, 1, 1, 31, 1, 1, 26, 1, 1, 21, 1, 1, 16, 1, 1, 11, 1, 1, 6, 1, 2}
```

{1.750000000000000000000000000000000000000, 1.651086956521739130434782608695652173913,
 1.651207807169788736609013106708959243521, 1.651207674575853308166206112074170238204,
 1.651207674659833607028742196307094146036, 1.651207674659799332308457820603640637546,
 1.651207674659799342030867011660573203690, 1.651207674659799342028842441076058603555,
 1.651207674659799342028842763457940139809, 1.651207674659799342028842763417431984385}

p=5, q=3:

2   1
1   0

i=1: {0}

20   17
7   6

i=2: {2, 1, 5, 2, 6}

i=3: {2, 1, 5, 1, 1, 10, 2, 10, 1, 1, 6}

i=4: {2, 1, 5, 1, 1, 10, 1, 1, 15, 2, 15, 1, 1, 10, 1, 1, 6}

i=5: {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 2, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

i=6:
 {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 1, 1, 25, 2, 25, 1, 1, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

i=7: {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 1, 1,
  25, 1, 1, 30, 2, 30, 1, 1, 25, 1, 1, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

i=8: {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 1, 1, 25, 1, 1, 30,
  1, 1, 35, 2, 35, 1, 1, 30, 1, 1, 25, 1, 1, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

i=9: {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 1, 1, 25, 1, 1, 30, 1, 1, 35, 1, 1,
  40, 2, 40, 1, 1, 35, 1, 1, 30, 1, 1, 25, 1, 1, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

i=10: {2, 1, 5, 1, 1, 10, 1, 1, 15, 1, 1, 20, 1, 1, 25, 1, 1, 30, 1, 1, 35, 1, 1, 40, 1, 1, 45,
  2, 45, 1, 1, 40, 1, 1, 35, 1, 1, 30, 1, 1, 25, 1, 1, 20, 1, 1, 15, 1, 1, 10, 1, 1, 6}

{0, 2.845238095238095238095238095238095238095,
 2.846690997566909975669099756690997566910, 2.846689137023735645976613219689277611392,
 2.846689138325188429851398408891090043834, 2.846689138324612446825083120587918151135,
 2.846689138324612621676469653219694031453, 2.846689138324612621637877412449205919406,
 2.846689138324612621637883878525045534941, 2.846689138324612621637883877674998601482}

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