# Unit 15, part 76.11, erweiterte Version

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, quotations, sayings, slogans, scurrilities, seeds, besun, etc.
collected for encouragement and the advantage of my students and of myself.

## Wort-Fundstücke, Gehörtes, Gelesenes, Zugelaufenes, Angeschwemmtes, …

Du brauchst Verrückte, um Verrücktes zu schaffen.
https://www.11freunde.de/node/430876

Zuhause ist immer dort, wo man für etwas kämpft.
Eva Illouz

Heißt das nun, die Mathematik existiere unabhängig vom menschlichen Bewusstsein, und wenn ja, wo und wie?
https://www.spektrum.de/rezension/buchkritik-zu-naturalismus/1623132?utm_medium=newsletter&utm_source=sdw-nl&utm_campaign=sdw-nl-buchrezensionen

Magnet-Akupressur, Fake oder Fakt?
**https**://www.newthingstoday.com/cms/de/root/**liporing**/advertorial/index6?fflux=1&affid=10

[**https**://myweeklyadvice.com/**euphoricfeet**/discount/de/?gclid=EAIaIQobChMIysy547-v4AIVmc13Ch0itAgPEAAYAiAAEgJ-7_D_BwE](https://myweeklyadvice.com/euphoricfeet/discount/de/?gclid=EAIaIQobChMIysy547-v4AIVmc13Ch0itAgPEAAYAiAAEgJ-7_D_BwE)
Mehr?

# Von nun an gibt es keinerlei Geheimnisse mehr.

In der Straßenbahn gehört.

## Der Mentaltresor.

## Durchdigitalisierung der Gesellschaft

https://www.welt.de/politik/deutschland/article188420619/Fluechtlinge-Staedtebundchef-Uwe-Brandl-sieht-Integration-zwiespaeltig.html

https://www.newscientist.com/article/mg24132160-400-**the-baffling-quantum-maths-solution-it-took-10-years-to-understand/**

**XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX**

# Sandbox zur Diskussion „Primes and finite scf-palindromes“

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**Basic**

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, 211, 223, 227, 229, 233, 239, 241, 251, 257, 263, 269, 271, 277, 281, 283, 293, 307, 311, 313, 317, 331, 337, 347, 349, 353, 359, 367, 373, 379, 383, 389, 397, 401, 409, 419, 421, 431, 433, 439, 443, 449, 457, 461, 463, 467, 479, 487, 491, 499, 503, 509, 521, 523, 541, 547, 557, 563, 569, 571, 577, 587, 593, 599, 601, 607, 613, 617, 619, 631, 641, 643, 647, 653, 659, 661, 673, 677, 683, 691, 701, 709, 719, 727, 733, 739, 743, 751, 757, 761, 769, 773, 787, 797, 809, 811, 821, 823, 827, 829, 839, 853, 857, 859, 863, 877, 881, 883, 887, 907, 911, 919, 929, 937, 941, 947, 953, 967, 971, 977, 983, 991, 997, 1009, 1013, 1019, 1021, 1031, 1033, 1039, 1049, 1051, 1061, 1063, 1069, 1087, 1091, 1093, 1097, 1103, 1109, 1117, 1123, 1129, 1151, 1153, 1163, 1171, 1181, 1187, 1193, 1201, 1213, 1217, 1223, 1229, 1231, 1237, 1249, 1259, 1277, 1279, 1283, 1289, 1291, 1297, 1301, 1303, 1307, 1319, 1321, 1327, 1361, 1367, 1373, 1381, 1399, 1409, 1423, 1427, 1429, 1433, 1439, 1447, 1451, 1453, 1459, 1471, 1481, 1483, 1487, 1489, 1493, 1499, 1511, 1523, 1531, 1543, 1549, 1553, 1559, 1567, 1571, 1579, 1583, 1597, 1601, 1607, 1609, 1613, 1619, 1621, 1627, 1637, 1657, 1663, 1667, 1669, 1693, 1697, 1699, 1709, 1721, 1723, 1733, 1741, 1747, 1753, 1759, 1777, 1783, 1787, 1789, 1801, 1811, 1823, 1831, 1847, 1861, 1867, 1871, 1873, 1877, 1879, 1889, 1901, 1907, 1913, 1931, 1933, 1949, 1951, 1973, 1979, 1987, 1993, 1997, 1999, 2003, 2011, 2017, 2027, 2029, 2039, 2053, 2063, 2069, 2081, 2083, 2087, 2089, 2099, 2111, 2113, 2129, 2131, 2137, 2141, 2143, 2153, 2161, 2179, 2203, 2207, 2213, 2221, 2237, 2239, 2243, 2251, 2267, 2269, 2273, 2281, 2287, 2293, 2297, 2309, 2311, 2333, 2339, 2341, 2347, 2351, 2357, 2371, 2377, 2381, 2383, 2389, 2393, 2399, 2411, 2417, 2423, 2437, 2441, 2447, 2459, 2467, 2473, 2477, 2503, 2521, 2531, 2539, 2543, 2549, 2551, 2557, 2579, 2591, 2593, 2609, 2617, 2621, 2633, 2647, 2657, 2659, 2663, 2671, 2677, 2683, 2687, 2689, 2693, 2699, 2707, 2711, 2713, 2719, 2729, 2731, 2741, 2749, 2753, 2767, 2777, 2789, 2791, 2797, 2801, 2803, 2819, 2833, 2837, 2843, 2851, 2857, 2861, 2879, 2887, 2897, 2903, 2909, 2917, 2927, 2939, 2953, 2957, 2963, 2969, 2971, 2999, 3001, 3011, 3019, 3023, 3037, 3041, 3049, 3061, 3067, 3079, 3083, 3089, 3109, 3119, 3121, 3137, 3163, 3167, 3169, 3181, 3187, 3191, 3203, 3209, 3217, 3221, 3229, 3251, 3253, 3257, 3259, 3271, 3299, 3301, 3307, 3313, 3319, 3323, 3329, 3331, 3343, 3347, 3359, 3361, 3371, 3373, 3389, 3391, 3407, 3413, 3433, 3449, 3457, 3461, 3463, 3467, 3469, 3491, 3499, 3511, 3517, 3527, 3529, 3533, 3539, 3541, 3547, 3557, 3559, 3571, 3581, 3583, 3593, 3607, 3613, 3617, 3623, 3631, 3637, 3643, 3659, 3671, 3673, 3677, 3691, 3697, 3701, 3709, 3719, 3727, 3733, 3739, 3761, 3767, 3769, 3779, 3793, 3797, 3803, 3821, 3823, 3833, 3847, 3851, 3853, 3863, 3877, 3881, 3889, 3907, 3911, 3917, 3919, 3923, 3929, 3931, 3943, 3947, 3967, 3989, 4001, 4003, 4007, 4013, 4019, 4021, 4027, 4049, 4051, 4057, 4073, 4079, 4091, 4093, 4099, 4111, 4127, 4129, 4133, 4139, 4153, 4157, 4159, 4177, 4201, 4211, 4217, 4219, 4229, 4231, 4241, 4243, 4253, 4259, 4261, 4271, 4273, 4283, 4289, 4297, 4327, 4337, 4339, 4349,

4357, 4363, 4373, 4391, 4397, 4409, 4421, 4423, 4441, 4447, 4451, 4457, 4463, 4481, 4483, 4493, 4507, 4513, 4517, 4519, 4523, 4547, 4549, 4561, 4567, 4583, 4591, 4597, 4603, 4621, 4637, 4639, 4643, 4649, 4651, 4657, 4663, 4673, 4679, 4691, 4703, 4721, 4723, 4729, 4733, 4751, 4759, 4783, 4787, 4789, 4793, 4799, 4801, 4813, 4817, 4831, 4861, 4871, 4877, 4889, 4903, 4909, 4919, 4931, 4933, 4937, 4943, 4951, 4957, 4967, 4969, 4973, 4987, 4993, 4999, 5003, 5009, 5011, 5021, 5023, 5039, 5051, 5059, 5077, 5081, 5087, 5099, 5101, 5107, 5113, 5119, 5147, 5153, 5167, 5171, 5179, 5189, 5197, 5209, 5227, 5231, 5233, 5237, 5261, 5273, 5279, 5281, 5297, 5303, 5309, 5323, 5333, 5347, 5351, 5381, 5387, 5393, 5399, 5407, 5413, 5417, 5419, 5431, 5437, 5441, 5443, 5449, 5471, 5477, 5479, 5483, 5501, 5503, 5507, 5519, 5521, 5527, 5531, 5557, 5563, 5569, 5573, 5581, 5591, 5623, 5639, 5641, 5647, 5651, 5653, 5657, 5659, 5669, 5683, 5689, 5693, 5701, 5711, 5717, 5737, 5741, 5743, 5749, 5779, 5783, 5791, 5801, 5807, 5813, 5821, 5827, 5839, 5843, 5849, 5851, 5857, 5861, 5867, 5869, 5879, 5881, 5897, 5903, 5923, 5927, 5939, 5953, 5981, 5987, 6007, 6011, 6029, 6037, 6043, 6047, 6053, 6067, 6073, 6079, 6089, 6091, 6101, 6113, 6121, 6131, 6133, 6143, 6151, 6163, 6173, 6197, 6199, 6203, 6211, 6217, 6221, 6229, 6247, 6257, 6263, 6269, 6271, 6277, 6287, 6299, 6301, 6311, 6317, 6323, 6329, 6337, 6343, 6353, 6359, 6361, 6367, 6373, 6379, 6389, 6397, 6421, 6427, 6449, 6451, 6469, 6473, 6481, 6491, 6521, 6529, 6547, 6551, 6553, 6563, 6569, 6571, 6577, 6581, 6599, 6607, 6619, 6637, 6653, 6659, 6661, 6673, 6679, 6689, 6691, 6701, 6703, 6709, 6719, 6733, 6737, 6761, 6763, 6779, 6781, 6791, 6793, 6803, 6823, 6827, 6829, 6833, 6841, 6857, 6863, 6869, 6871, 6883, 6899, 6907, 6911, 6917, 6947, 6949, 6959, 6961, 6967, 6971, 6977, 6983, 6991, 6997, 7001, 7013, 7019, 7027, 7039, 7043, 7057, 7069, 7079, 7103, 7109, 7121, 7127, 7129, 7151, 7159, 7177, 7187, 7193, 7207, 7211, 7213, 7219, 7229, 7237, 7243, 7247, 7253, 7283, 7297, 7307, 7309, 7321, 7331, 7333, 7349, 7351, 7369, 7393, 7411, 7417, 7433, 7451, 7457, 7459, 7477, 7481, 7487, 7489, 7499, 7507, 7517, 7523, 7529, 7537, 7541, 7547, 7549, 7559, 7561, 7573, 7577, 7583, 7589, 7591, 7603, 7607, 7621, 7639, 7643, 7649, 7669, 7673, 7681, 7687, 7691, 7699, 7703, 7717, 7723, 7727, 7741, 7753, 7757, 7759, 7789, 7793, 7817, 7823, 7829, 7841, 7853, 7867, 7873, 7877, 7879, 7883, 7901, 7907, 7919, 7927, 7933, 7937, 7949, 7951, 7963, 7993, 8009, 8011, 8017, 8039, 8053, 8059, 8069, 8081, 8087, 8089, 8093, 8101, 8111, 8117, 8123, 8147, 8161, 8167, 8171, 8179, 8191, 8209, 8219, 8221, 8231, 8233, 8237, 8243, 8263, 8269, 8273, 8287, 8291, 8293, 8297, 8311, 8317, 8329, 8353, 8363, 8369, 8377, 8387, 8389, 8419, 8423, 8429, 8431, 8443, 8447, 8461, 8467, 8501, 8513, 8521, 8527, 8537, 8539, 8543, 8563, 8573, 8581, 8597, 8599, 8609, 8623, 8627, 8629, 8641, 8647, 8663, 8669, 8677, 8681, 8689, 8693, 8699, 8707, 8713, 8719, 8731, 8737, 8741, 8747, 8753, 8761, 8779, 8783, 8803, 8807, 8819, 8821, 8831, 8837, 8839, 8849, 8861, 8863, 8867, 8887, 8893, 8923, 8929, 8933, 8941, 8951, 8963, 8969, 8971, 8999, 9001, 9007, 9011, 9013, 9029, 9041, 9043, 9049, 9059, 9067, 9091, 9103, 9109, 9127, 9133, 9137, 9151, 9157, 9161, 9173, 9181, 9187, 9199, 9203, 9209, 9221, 9227, 9239, 9241, 9257, 9277, 9281, 9283, 9293, 9311, 9319, 9323, 9337, 9341, 9343, 9349, 9371, 9377, 9391, 9397, 9403, 9413, 9419, 9421, 9431, 9433, 9437, 9439, 9461, 9463, 9467, 9473, 9479, 9491, 9497, 9511, 9521, 9533, 9539, 9547, 9551, 9587, 9601, 9613, 9619, 9623, 9629, 9631, 9643, 9649, 9661, 9677, 9679, 9689, 9697, 9719, 9721, 9733, 9739, 9743, 9749, 9767, 9769, 9781, 9787, 9791, 9803, 9811, 9817, 9829, 9833, 9839, 9851, 9857, 9859, 9871, 9883, 9887, 9901, 9907, 9923, 9929, 9931, 9941, 9949, 9967, 9973, …

$$[1;1,n,1,1] = \frac{4(n+1)}{2n+3} = 1 + \frac{2n+1}{2n+3}$$

$$[1;1,\ \frac{m-1}{2},1,1] = \frac{2m+2}{m+2} = 1 + \frac{m}{m+2}$$

$$[1;n,1,n,1] = \frac{(n+1)(n+3)}{(n+1)^2+n} = 1 + \frac{n+2}{(n+1)^2+n}$$

$$[1;1,1,n,1,1,1] = \frac{9n+12}{6n+7} = 1 + \frac{3n+5}{6n+7}$$

$$[1;n,1,1,1,n,1] = \frac{(3n+4)(n+2)}{3(n+1)^2+n} = 1 + \frac{3n+5}{3(n+1)^2+n}$$

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$$[1;1,2,1,1] = \frac{12}{7} = 1+\frac{5}{7}$$

$$[1;2,1,2,1] = \frac{15}{11}$$

$$[1;1,1,2,1,1,1] = \frac{30}{19} = 1+\frac{11}{19}$$

$$[1;2,1,1,1,2,1] = \frac{11}{29}$$

$$[1;1,4,1,1] = \frac{20}{11}$$

$$[1;4,1,4,1] = \frac{35}{29}$$

$$[1;1,1,4,1,1,1] = \frac{48}{31} = 1+\frac{17}{31}$$

$$[1;4,1,1,1,4,1] = \frac{96}{79} = 1+\frac{17}{79}$$

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

$$[1;1,5,1,1] = \frac{24}{13} = 1+\frac{11}{13}$$

$$[1;5,1,5,1] = \frac{48}{41} \qquad [1;1,1,5,1,1,1] = \frac{57}{37}$$

$$[1;1,7,1,1] = \frac{32}{17} \qquad [1;7,1,7,1] = \frac{80}{71}$$

$$[1;1,13,1,1] = \frac{56}{29}$$

$$[1;1,17,1,1] = \frac{72}{37}$$

$$[1;1,19,1,1] = \frac{80}{41} \qquad [1;19,1,19,1] = \frac{440}{419}$$

$$[1;1,29,1,1] = \frac{120}{61} = 1+\frac{59}{61}$$

$$[1;1,43,1,1] = \frac{176}{89}$$

$$[1;1,47,1,1] = \frac{192}{97}$$

$$[1;1,53,1,1] = \frac{216}{109} = 1+\frac{107}{109}$$

$$[1;1,67,1,1] = \frac{272}{137}$$

$$[1;1,73,1,1] = \frac{296}{149}$$

$$[1;1,89,1,1] = \frac{360}{181} = 1+\frac{179}{181}$$

↓

$89 \rightarrow \frac{360}{181} = 1 + \frac{179}{181}$

$97 \rightarrow \frac{360}{197}$

$113 \rightarrow \frac{456}{229} = 1 + \frac{227}{229}$

↓

127, 512/257
137, 552/277
139, 560/281
157, 632/317
167, 672/337
173, 696/349 = 1+347/349
193, 776/389
197, 792/397
199, 800/401
223, 896/449
227, 912/457
229, 920/461
269, 1080/541
277, 1112/557
283, 1136/569
307, 1232/617
337, 1352/677
349, 1400/701
353, 1416/709
379, 1520/761
383, 1536/769
397, 1592/797
409, 1640/821
439, 1760/881 = 1+879/881
463, 1856/929

↓

467, 1872/937
487, 1952/977
503, 2016/1009
509, 2040/1021
523, 2096/1049
547, 2192/1097
557, 2232/1117
563, 2256/1129
599, 2400/1201
607, 2432/1217
613, 2456/1229
617, 2472/1237
643, 2576/1289
647, 2592/1297
659, 2640/1321
739, 2960/1481
743, 2976/1489
773, 3096/1549
797, 3192/1597
809, 3240/1621
827, 3312/1657
853, 3416/1709
859, 3440/1721

887, 3552/1777
929, 3720/1861
937, 3752{1877
997, 3992/1997
1013, 4056/2029
1033, 4136/2069
1039, 4160/2081
1063, 4256/2129
1069, 4280/2141
1109, 4440/2221
1117, 4472/2237
1153, 4616/2309
1187, 4752/2377
1193, 4776/2389
1217, 4872/2437
1237, 4952/2477
1259, 5040/2521
1277, 5112/2557
1303, 5216/2609
1307, 5232/2617
1327, 5312/2657
1373, 5496/2749
1399, 5600/2801
1427, 5712/2857
1429, 5720/2861
1447, 5792/2897
1453, 5816/2909
1483, 5936/2969
1499, 6000/3001
1523, 6096/3049
1543, 6176/3089
1553, 6216/3109
1559, 6240/3121
1567, 6272/3137
1583, 6336/3169
1607, 6432/3217
1609, 6440/3221
1613, 6456/3229
1627, 6512/3257

$$\left\{1609, \frac{6440}{3221}\right\}, \left\{1613, \frac{6456}{3229}\right\}, \left\{1627, \frac{6512}{3257}\right\}, \left\{1663, \frac{6656}{3329}\right\}, \left\{1693, \frac{6776}{3389}\right\}, \left\{1723, \frac{6896}{3449}\right\},$$
$$\left\{1733, \frac{6936}{3469}\right\}, \left\{1777, \frac{7112}{3557}\right\}, \left\{1789, \frac{7160}{3581}\right\}, \left\{1847, \frac{7392}{3697}\right\}, \left\{1879, \frac{7520}{3761}\right\}, \left\{1993, \frac{7976}{3989}\right\},$$
$$\left\{1999, \frac{8000}{4001}\right\}, \left\{2027, \frac{8112}{4057}\right\}, \left\{2063, \frac{8256}{4129}\right\}, \left\{2087, \frac{8352}{4177}\right\}, \left\{2099, \frac{8400}{4201}\right\}, \left\{2113, \frac{8456}{4229}\right\},$$
$$\left\{2129, \frac{8520}{4261}\right\}, \left\{2143, \frac{8576}{4289}\right\}, \left\{2203, \frac{8816}{4409}\right\}, \left\{2239, \frac{8960}{4481}\right\}, \left\{2273, \frac{9096}{4549}\right\}, \left\{2297, \frac{9192}{4597}\right\},$$
$$\left\{2309, \frac{9240}{4621}\right\}, \left\{2393, \frac{9576}{4789}\right\}, \left\{2399, \frac{9600}{4801}\right\}, \left\{2437, \frac{9752}{4877}\right\}, \left\{2467, \frac{9872}{4937}\right\}, \left\{2477, \frac{9912}{4957}\right\},$$
$$\left\{2503, \frac{10016}{5009}\right\}, \left\{2539, \frac{10160}{5081}\right\}, \left\{2549, \frac{10200}{5101}\right\}, \left\{2593, \frac{10376}{5189}\right\}, \left\{2617, \frac{10472}{5237}\right\},$$
$$\left\{2647, \frac{10592}{5297}\right\}, \left\{2689, \frac{10760}{5381}\right\}, \left\{2707, \frac{10832}{5417}\right\}, \left\{2719, \frac{10880}{5441}\right\}, \left\{2749, \frac{11000}{5501}\right\},$$
$$\left\{2777, \frac{11112}{5557}\right\}, \left\{2789, \frac{11160}{5581}\right\}, \left\{2819, \frac{11280}{5641}\right\}, \left\{2833, \frac{11336}{5669}\right\}, \left\{2843, \frac{11376}{5689}\right\},$$
$$\left\{2857, \frac{11432}{5717}\right\}, \left\{2909, \frac{11640}{5821}\right\}, \left\{2927, \frac{11712}{5857}\right\}, \left\{2939, \frac{11760}{5881}\right\}, \left\{3049, \frac{12200}{6101}\right\},$$
$$\left\{3109, \frac{12440}{6221}\right\}, \left\{3137, \frac{12552}{6277}\right\}, \left\{3163, \frac{12656}{6329}\right\}, \left\{3167, \frac{12672}{6337}\right\}, \left\{3209, \frac{12840}{6421}\right\},$$
$$\left\{3259, \frac{13040}{6521}\right\}, \left\{3329, \frac{13320}{6661}\right\}, \left\{3343, \frac{13376}{6689}\right\}, \left\{3389, \frac{13560}{6781}\right\}, \left\{3413, \frac{13656}{6829}\right\},$$
$$\left\{3433, \frac{13736}{6869}\right\}, \left\{3457, \frac{13832}{6917}\right\}, \left\{3499, \frac{14000}{7001}\right\}, \left\{3527, \frac{14112}{7057}\right\}, \left\{3533, \frac{14136}{7069}\right\},$$
$$\left\{3559, \frac{14240}{7121}\right\}, \left\{3613, \frac{14456}{7229}\right\}, \left\{3617, \frac{14472}{7237}\right\}, \left\{3659, \frac{14640}{7321}\right\}, \left\{3673, \frac{14696}{7349}\right\},$$
$$\left\{3727, \frac{14912}{7457}\right\}, \left\{3739, \frac{14960}{7481}\right\}, \left\{3767, \frac{15072}{7537}\right\}, \left\{3769, \frac{15080}{7541}\right\}, \left\{3779, \frac{15120}{7561}\right\},$$
$$\left\{3793, \frac{15176}{7589}\right\}, \left\{3823, \frac{15296}{7649}\right\}, \left\{3833, \frac{15336}{7669}\right\}, \left\{3877, \frac{15512}{7757}\right\}, \left\{3907, \frac{15632}{7817}\right\},$$
$$\left\{3919, \frac{15680}{7841}\right\}, \left\{3967, \frac{15872}{7937}\right\}, \left\{4003, \frac{16016}{8009}\right\}, \left\{4007, \frac{16032}{8017}\right\}, \left\{4049, \frac{16200}{8101}\right\},$$
$$\left\{4057, \frac{16232}{8117}\right\}, \left\{4079, \frac{16320}{8161}\right\}, \left\{4133, \frac{16536}{8269}\right\}, \left\{4157, \frac{16632}{8317}\right\}, \left\{4229, \frac{16920}{8461}\right\},$$
$$\left\{4259, \frac{17040}{8521}\right\}, \left\{4289, \frac{17160}{8581}\right\}, \left\{4297, \frac{17192}{8597}\right\}, \left\{4337, \frac{17352}{8677}\right\}, \left\{4339, \frac{17360}{8681}\right\},$$
$$\left\{4409, \frac{17640}{8821}\right\}, \left\{4423, \frac{17696}{8849}\right\}, \left\{4463, \frac{17856}{8929}\right\}, \left\{4483, \frac{17936}{8969}\right\}, \left\{4513, \frac{18056}{9029}\right\},$$
$$\left\{4519, \frac{18080}{9041}\right\}, \left\{4523, \frac{18096}{9049}\right\}, \left\{4567, \frac{18272}{9137}\right\}, \left\{4603, \frac{18416}{9209}\right\}, \left\{4637, \frac{18552}{9277}\right\},$$
$$\left\{4639, \frac{18560}{9281}\right\}, \left\{4673, \frac{18696}{9349}\right\}, \left\{4729, \frac{18920}{9461}\right\}, \left\{4759, \frac{19040}{9521}\right\}, \left\{4799, \frac{19200}{9601}\right\},$$

$$\left\{4813, \frac{19256}{9629}\right\}, \left\{4889, \frac{19560}{9781}\right\}, \left\{4969, \frac{19880}{9941}\right\}, \left\{4973, \frac{19896}{9949}\right\}, \left\{5003, \frac{20016}{10009}\right\},$$
$$\left\{5087, \frac{20352}{10177}\right\}, \left\{5167, \frac{20672}{10337}\right\}, \left\{5227, \frac{20912}{10457}\right\}, \left\{5237, \frac{20952}{10477}\right\}, \left\{5297, \frac{21192}{10597}\right\},$$

$\downarrow \ldots$

Untersuchen Sie die Häufigkeitsverteilung dieser scf-Primzahlen in der Menge der natürlichen Zahlen und vergleichen Sie mit der Primzahlfunktion π(x) [1,2].

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

$$[1;5,1,5,1] = \frac{48}{41}$$

$$[1;7,1,7,1] = \frac{80}{71}$$

$$[1;19,1,19,1] = \frac{440}{419}$$

$$[1;23,1,23,1] = \frac{624}{599}$$

$$[1;29,1,29,1] = \frac{960}{929}$$

$$[1;37,1,37,1] = \frac{1520}{1481}$$

$$[1;43,1,43,1] = \frac{2024}{1979}$$

$$[1;47,1,47,1] = \frac{2400}{2351}$$

$$[1;53,1,53,1] = \frac{3024}{2969}$$

$$[1;59,1,59,1] = \frac{3720}{3659}$$

$$[1;67,1,67,1] = \frac{4760}{4691}$$

$$[1;113,1,113,1] = \frac{13224}{13109}$$

$$[1;137,1,137,1] = \frac{19320}{19181}$$

$$[1;139,1,139,1] = \frac{19880}{19739}$$

$$[1;157,1,157,1] = \frac{25280}{25121}$$

$$[1;163,1,163,1] = \frac{27224}{27059}$$

$$[1;173,1,173,1] = \frac{30624}{30449}$$

$$[1;179,1,179,1] = \frac{32760}{32579}$$

$$[1;229,1,229,1]=\frac{53360}{53129}$$
$$[1;239,1,239,1]=\frac{58080}{57839}$$
$$[1;257,1,257,1]=\frac{67080}{66821}$$
$$[1;263,1,263,1]=\frac{70224}{69959}$$
$$[1;293,1,293,1]=\frac{87024}{86729}$$
$$[1;313,1,313,1]=\frac{99224}{98909}$$

$$\left\{293,\frac{87\,024}{86\,729}\right\},\left\{313,\frac{99\,224}{98\,909}\right\},\left\{349,\frac{123\,200}{122\,849}\right\},\left\{353,\frac{126\,024}{125\,669}\right\},\left\{359,\frac{130\,320}{129\,959}\right\},$$
$$\left\{373,\frac{140\,624}{140\,249}\right\},\left\{379,\frac{145\,160}{144\,779}\right\},\left\{419,\frac{177\,240}{176\,819}\right\},\left\{449,\frac{203\,400}{202\,949}\right\},\left\{467,\frac{219\,960}{219\,491}\right\},$$
$$\left\{499,\frac{251\,000}{250\,499}\right\},\left\{503,\frac{255\,024}{254\,519}\right\},\left\{509,\frac{261\,120}{260\,609}\right\},\left\{547,\frac{301\,400}{300\,851}\right\},\left\{577,\frac{335\,240}{334\,661}\right\},$$
$$\left\{587,\frac{346\,920}{346\,331}\right\},\left\{593,\frac{354\,024}{353\,429}\right\},\left\{617,\frac{383\,160}{382\,541}\right\},\left\{643,\frac{416\,024}{415\,379}\right\},\left\{647,\frac{421\,200}{420\,551}\right\},$$
$$\left\{653,\frac{429\,024}{428\,369}\right\},\left\{719,\frac{519\,840}{519\,119}\right\},\left\{727,\frac{531\,440}{530\,711}\right\},\left\{797,\frac{638\,400}{637\,601}\right\},\left\{883,\frac{783\,224}{782\,339}\right\},$$
$$\left\{929,\frac{866\,760}{865\,829}\right\},\left\{967,\frac{938\,960}{937\,991}\right\},\left\{983,\frac{970\,224}{969\,239}\right\},\left\{997,\frac{998\,000}{997\,001}\right\},\left\{1013,\frac{1\,030\,224}{1\,029\,209}\right\},$$
$$\left\{1033,\frac{1\,071\,224}{1\,070\,189}\right\},\left\{1049,\frac{1\,104\,600}{1\,103\,549}\right\},\left\{1063,\frac{1\,134\,224}{1\,133\,159}\right\},\left\{1093,\frac{1\,199\,024}{1\,197\,929}\right\},$$
$$\left\{1097,\frac{1\,207\,800}{1\,206\,701}\right\},\left\{1103,\frac{1\,221\,024}{1\,219\,919}\right\},\left\{1109,\frac{1\,234\,320}{1\,233\,209}\right\},\left\{1123,\frac{1\,265\,624}{1\,264\,499}\right\},$$
$$\left\{1129,\frac{1\,279\,160}{1\,278\,029}\right\},\left\{1163,\frac{1\,357\,224}{1\,356\,059}\right\},\left\{1217,\frac{1\,485\,960}{1\,484\,741}\right\},\left\{1237,\frac{1\,535\,120}{1\,533\,881}\right\},$$
$$\left\{1259,\frac{1\,590\,120}{1\,588\,859}\right\},\left\{1303,\frac{1\,703\,024}{1\,701\,719}\right\},\left\{1307,\frac{1\,713\,480}{1\,712\,171}\right\},\left\{1423,\frac{2\,030\,624}{2\,029\,199}\right\},$$
$$\left\{1459,\frac{2\,134\,520}{2\,133\,059}\right\},\left\{1489,\frac{2\,223\,080}{2\,221\,589}\right\},\left\{1493,\frac{2\,235\,024}{2\,233\,529}\right\},\left\{1607,\frac{2\,588\,880}{2\,587\,271}\right\},$$
$$\left\{1627,\frac{2\,653\,640}{2\,652\,011}\right\},\left\{1669,\frac{2\,792\,240}{2\,790\,569}\right\},\left\{1697,\frac{2\,886\,600}{2\,884\,901}\right\},\left\{1709,\frac{2\,927\,520}{2\,925\,809}\right\},$$

$$\left\{1759, \frac{3\,101\,120}{3\,099\,359}\right\}, \left\{1787, \frac{3\,200\,520}{3\,198\,731}\right\}, \left\{1823, \frac{3\,330\,624}{3\,328\,799}\right\}, \left\{1847, \frac{3\,418\,800}{3\,416\,951}\right\},$$
$$\left\{1867, \frac{3\,493\,160}{3\,491\,291}\right\}, \left\{1987, \frac{3\,956\,120}{3\,954\,131}\right\}, \left\{1999, \frac{4\,004\,000}{4\,001\,999}\right\}, \left\{2053, \frac{4\,223\,024}{4\,220\,969}\right\},$$
$$\left\{2069, \frac{4\,289\,040}{4\,286\,969}\right\}, \left\{2099, \frac{4\,414\,200}{4\,412\,099}\right\}, \left\{2203, \frac{4\,862\,024}{4\,859\,819}\right\}, \left\{2267, \frac{5\,148\,360}{5\,146\,091}\right\},$$
$$\left\{2297, \frac{5\,285\,400}{5\,283\,101}\right\}, \left\{2309, \frac{5\,340\,720}{5\,338\,409}\right\}, \left\{2347, \frac{5\,517\,800}{5\,515\,451}\right\}, \left\{2377, \frac{5\,659\,640}{5\,657\,261}\right\},$$
$$\left\{2447, \frac{5\,997\,600}{5\,995\,151}\right\}, \left\{2467, \frac{6\,095\,960}{6\,093\,491}\right\}, \left\{2633, \frac{6\,943\,224}{6\,940\,589}\right\}, \left\{2693, \frac{7\,263\,024}{7\,260\,329}\right\},$$
$$\left\{2707, \frac{7\,338\,680}{7\,335\,971}\right\}, \left\{2729, \frac{7\,458\,360}{7\,455\,629}\right\}, \left\{2753, \frac{7\,590\,024}{7\,587\,269}\right\}, \left\{2879, \frac{8\,300\,160}{8\,297\,279}\right\},$$
$$\left\{2887, \frac{8\,346\,320}{8\,343\,431}\right\}, \left\{2897, \frac{8\,404\,200}{8\,401\,301}\right\}, \left\{2927, \frac{8\,579\,040}{8\,576\,111}\right\}, \left\{3037, \frac{9\,235\,520}{9\,232\,481}\right\},$$
$$\left\{3169, \frac{10\,055\,240}{10\,052\,069}\right\}, \left\{3187, \frac{10\,169\,720}{10\,166\,531}\right\}, \left\{3209, \frac{10\,310\,520}{10\,307\,309}\right\}, \left\{3257, \frac{10\,621\,080}{10\,617\,821}\right\},$$
$$\left\{3343, \frac{11\,189\,024}{11\,185\,679}\right\}, \left\{3389, \frac{11\,498\,880}{11\,495\,489}\right\}, \left\{3457, \frac{11\,964\,680}{11\,961\,221}\right\}, \left\{3463, \frac{12\,006\,224}{12\,002\,759}\right\},$$
$$\left\{3517, \frac{12\,383\,360}{12\,379\,841}\right\}, \left\{3527, \frac{12\,453\,840}{12\,450\,311}\right\}, \left\{3529, \frac{12\,467\,960}{12\,464\,429}\right\}, \left\{3593, \frac{12\,924\,024}{12\,920\,429}\right\},$$
$$\left\{3637, \frac{13\,242\,320}{13\,238\,681}\right\}, \left\{3659, \frac{13\,402\,920}{13\,399\,259}\right\}, \left\{3673, \frac{13\,505\,624}{13\,501\,949}\right\}, \left\{3697, \frac{13\,682\,600}{13\,678\,901}\right\},$$
$$\left\{3733, \frac{13\,950\,224}{13\,946\,489}\right\}, \left\{3767, \frac{14\,205\,360}{14\,201\,591}\right\}, \left\{3833, \frac{14\,707\,224}{14\,703\,389}\right\}, \left\{3847, \frac{14\,814\,800}{14\,810\,951}\right\},$$
$$\left\{3877, \frac{15\,046\,640}{15\,042\,761}\right\}, \left\{3943, \frac{15\,563\,024}{15\,559\,079}\right\}, \left\{3947, \frac{15\,594\,600}{15\,590\,651}\right\}, \left\{3989, \frac{15\,928\,080}{15\,924\,089}\right\},$$
$$\left\{4099, \frac{16\,818\,200}{16\,814\,099}\right\}, \left\{4157, \frac{17\,297\,280}{17\,293\,121}\right\}, \left\{4159, \frac{17\,313\,920}{17\,309\,759}\right\}, \left\{4177, \frac{17\,464\,040}{17\,459\,861}\right\},$$
$$\left\{4217, \frac{17\,799\,960}{17\,795\,741}\right\}, \left\{4243, \frac{18\,020\,024}{18\,015\,779}\right\}, \left\{4253, \frac{18\,105\,024}{18\,100\,769}\right\}, \left\{4273, \frac{18\,275\,624}{18\,271\,349}\right\},$$
$$\left\{4283, \frac{18\,361\,224}{18\,356\,939}\right\}, \left\{4327, \frac{18\,740\,240}{18\,735\,911}\right\}, \left\{4337, \frac{18\,826\,920}{18\,822\,581}\right\}, \left\{4349, \frac{18\,931\,200}{18\,926\,849}\right\},$$
$$\left\{4447, \frac{19\,793\,600}{19\,789\,151}\right\}, \left\{4493, \frac{20\,205\,024}{20\,200\,529}\right\}, \left\{4507, \frac{20\,331\,080}{20\,326\,571}\right\}, \left\{4603, \frac{21\,206\,024}{21\,201\,419}\right\},$$
$$\left\{4657, \frac{21\,706\,280}{21\,701\,621}\right\}, \left\{4663, \frac{21\,762\,224}{21\,757\,559}\right\}, \left\{4733, \frac{22\,420\,224}{22\,415\,489}\right\}, \left\{4759, \frac{22\,667\,120}{22\,662\,359}\right\},$$
$$\left\{4793, \frac{22\,992\,024}{22\,987\,229}\right\}, \left\{4799, \frac{23\,049\,600}{23\,044\,799}\right\}, \left\{4817, \frac{23\,222\,760}{23\,217\,941}\right\}, \left\{4933, \frac{24\,354\,224}{24\,349\,289}\right\},$$
$$\left\{4969, \frac{24\,710\,840}{24\,705\,869}\right\}, \left\{4987, \frac{24\,890\,120}{24\,885\,131}\right\}, \left\{4993, \frac{24\,950\,024}{24\,945\,029}\right\}, \left\{5003, \frac{25\,050\,024}{25\,045\,019}\right\},$$
$$\left\{5107, \frac{26\,101\,880}{26\,096\,771}\right\}, \left\{5113, \frac{26\,163\,224}{26\,158\,109}\right\}, \left\{5153, \frac{26\,574\,024}{26\,568\,869}\right\}, \left\{5167, \frac{26\,718\,560}{26\,713\,391}\right\},$$
$$\left\{5179, \frac{26\,842\,760}{26\,837\,579}\right\}, \left\{5233, \frac{27\,405\,224}{27\,399\,989}\right\}, \left\{5237, \frac{27\,447\,120}{27\,441\,881}\right\}, \left\{5303, \frac{28\,143\,024}{28\,137\,719}\right\},$$

↓ …

Untersuchen Sie die Häufigkeitsverteilung dieser scf-Primzahlen in der Menge der natürlichen Zahlen und vergleichen Sie mit der Primzahlfunktion π(x) [1,2].

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$$[1;5,1,7,1] = \frac{62}{53}$$

$$[1;11,1,13,1] = \frac{194}{179}$$

$$[1;41,1,43,1] = \frac{1934}{1889}$$

$$[1;59,1,61,1] = \frac{3842}{3779}$$

$$[1;71,1,73,1] = \frac{5474}{5399}$$

$$[1;101,1,103,1] = \frac{10814}{10709}$$

$$[1;107,1,109,1] = \frac{12098}{11987}$$

$$[1;137,1,139,1] = \frac{19598}{19457}$$

$$[1;179,1,181,1] = \frac{33122}{32939}$$

$$[1;227,1,229,1] = \frac{52898}{52667}$$

$$[1;269,1,271,1] = \frac{73982}{73709}$$

$$[1;281,1,283,1] = \frac{80654}{80369}$$

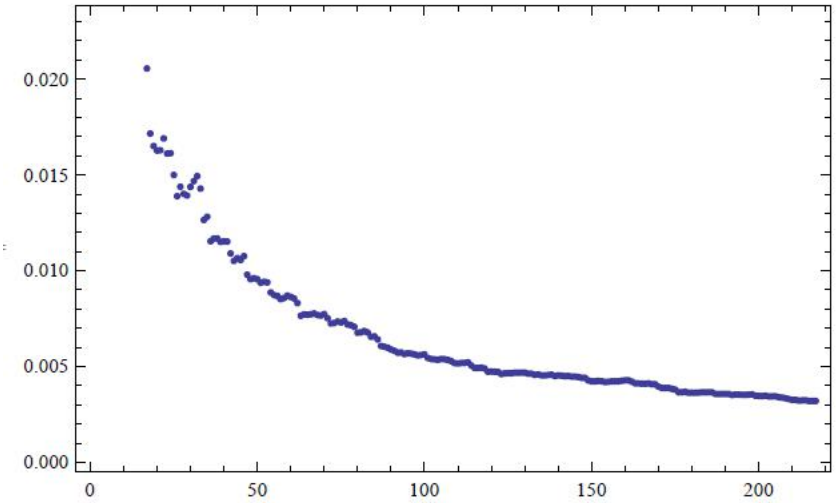
$$\left\{\left\{\{1, 5, 1, 7, 1\}, \frac{62}{53}\right\}, \left\{\{1, 11, 1, 13, 1\}, \frac{194}{179}\right\}, \left\{\{1, 41, 1, 43, 1\}, \frac{1934}{1889}\right\},\right.$$
$$\left\{\{1, 59, 1, 61, 1\}, \frac{3842}{3779}\right\}, \left\{\{1, 71, 1, 73, 1\}, \frac{5474}{5399}\right\}, \left\{\{1, 101, 1, 103, 1\}, \frac{10\,814}{10\,709}\right\},$$
$$\left\{\{1, 107, 1, 109, 1\}, \frac{12\,098}{11\,987}\right\}, \left\{\{1, 137, 1, 139, 1\}, \frac{19\,598}{19\,457}\right\}, \left\{\{1, 179, 1, 181, 1\}, \frac{33\,122}{32\,939}\right\},$$
$$\left\{\{1, 227, 1, 229, 1\}, \frac{52\,898}{52\,667}\right\}, \left\{\{1, 269, 1, 271, 1\}, \frac{73\,982}{73\,709}\right\}, \left\{\{1, 281, 1, 283, 1\}, \frac{80\,654}{80\,369}\right\},$$
$$\left.\left\{\{1, 347, 1, 349, 1\}, \frac{122\,498}{122\,147}\right\}, \left\{\{1, 569, 1, 571, 1\}, \frac{327\,182}{326\,609}\right\},\right.$$

$$\left\{\{1, 599, 1, 601, 1\}, \frac{362\,402}{361\,799}\right\}, \left\{\{1, 617, 1, 619, 1\}, \frac{384\,398}{383\,777}\right\},$$
$$\left\{\{1, 827, 1, 829, 1\}, \frac{688\,898}{688\,067}\right\}, \left\{\{1, 1049, 1, 1051, 1\}, \frac{1\,106\,702}{1\,105\,649}\right\},$$
$$\left\{\{1, 1151, 1, 1153, 1\}, \frac{1\,331\,714}{1\,330\,559}\right\}, \left\{\{1, 1229, 1, 1231, 1\}, \frac{1\,517\,822}{1\,516\,589}\right\},$$
$$\left\{\{1, 1289, 1, 1291, 1\}, \frac{1\,669\,262}{1\,667\,969}\right\}, \left\{\{1, 1301, 1, 1303, 1\}, \frac{1\,700\,414}{1\,699\,109}\right\},$$
$$\left\{\{1, 1427, 1, 1429, 1\}, \frac{2\,044\,898}{2\,043\,467}\right\}, \left\{\{1, 1487, 1, 1489, 1\}, \frac{2\,220\,098}{2\,218\,607}\right\},$$
$$\left\{\{1, 1667, 1, 1669, 1\}, \frac{2\,788\,898}{2\,787\,227}\right\}, \left\{\{1, 1871, 1, 1873, 1\}, \frac{3\,511\,874}{3\,509\,999}\right\},$$
$$\left\{\{1, 1877, 1, 1879, 1\}, \frac{3\,534\,398}{3\,532\,517}\right\}, \left\{\{1, 1997, 1, 1999, 1\}, \frac{3\,999\,998}{3\,997\,997}\right\},$$
$$\left\{\{1, 2081, 1, 2083, 1\}, \frac{4\,343\,054}{4\,340\,969}\right\}, \left\{\{1, 2087, 1, 2089, 1\}, \frac{4\,368\,098}{4\,366\,007}\right\},$$
$$\left\{\{1, 2111, 1, 2113, 1\}, \frac{4\,468\,994}{4\,466\,879}\right\}, \left\{\{1, 2141, 1, 2143, 1\}, \frac{4\,596\,734}{4\,594\,589}\right\},$$
$$\left\{\{1, 2309, 1, 2311, 1\}, \frac{5\,345\,342}{5\,343\,029}\right\}, \left\{\{1, 2687, 1, 2689, 1\}, \frac{7\,236\,098}{7\,233\,407}\right\},$$
$$\left\{\{1, 2729, 1, 2731, 1\}, \frac{7\,463\,822}{7\,461\,089}\right\}, \left\{\{1, 3119, 1, 3121, 1\}, \frac{9\,746\,882}{9\,743\,759}\right\},$$
$$\left\{\{1, 3167, 1, 3169, 1\}, \frac{10\,048\,898}{10\,045\,727}\right\}, \left\{\{1, 3251, 1, 3253, 1\}, \frac{10\,588\,514}{10\,585\,259}\right\},$$
$$\left\{\{1, 3389, 1, 3391, 1\}, \frac{11\,505\,662}{11\,502\,269}\right\}, \left\{\{1, 3467, 1, 3469, 1\}, \frac{12\,040\,898}{12\,037\,427}\right\},$$
$$\left\{\{1, 3557, 1, 3559, 1\}, \frac{12\,673\,598}{12\,670\,037}\right\}, \left\{\{1, 3851, 1, 3853, 1\}, \frac{14\,853\,314}{14\,849\,459}\right\},$$
$$\left\{\{1, 4091, 1, 4093, 1\}, \frac{16\,760\,834}{16\,756\,739}\right\}, \left\{\{1, 4127, 1, 4129, 1\}, \frac{17\,056\,898}{17\,052\,767}\right\},$$
$$\left\{\{1, 4259, 1, 4261, 1\}, \frac{18\,164\,642}{18\,160\,379}\right\}, \left\{\{1, 4271, 1, 4273, 1\}, \frac{18\,267\,074}{18\,262\,799}\right\},$$
$$\left\{\{1, 4799, 1, 4801, 1\}, \frac{23\,059\,202}{23\,054\,399}\right\}, \left\{\{1, 5021, 1, 5023, 1\}, \frac{25\,240\,574}{25\,235\,549}\right\},$$
$$\left\{\{1, 5099, 1, 5101, 1\}, \frac{26\,030\,402}{26\,025\,299}\right\}, \left\{\{1, 5231, 1, 5233, 1\}, \frac{27\,394\,754}{27\,389\,519}\right\},$$
$$\left\{\{1, 5441, 1, 5443, 1\}, \frac{29\,637\,134}{29\,631\,689}\right\}, \left\{\{1, 5519, 1, 5521, 1\}, \frac{30\,492\,482}{30\,486\,959}\right\},$$
$$\left\{\{1, 5639, 1, 5641, 1\}, \frac{31\,832\,162}{31\,826\,519}\right\}, \left\{\{1, 6089, 1, 6091, 1\}, \frac{37\,112\,462}{37\,106\,369}\right\},$$
$$\left\{\{1, 6299, 1, 6301, 1\}, \frac{39\,715\,202}{39\,708\,899}\right\}, \left\{\{1, 6449, 1, 6451, 1\}, \frac{41\,628\,302}{41\,621\,849}\right\},$$

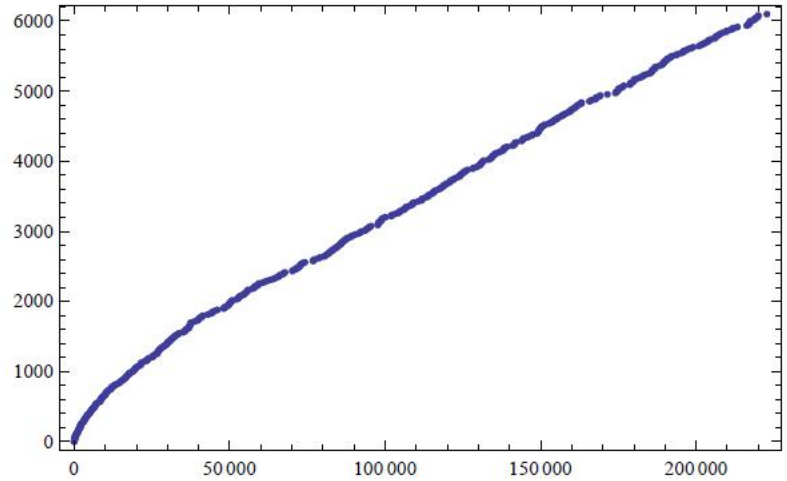
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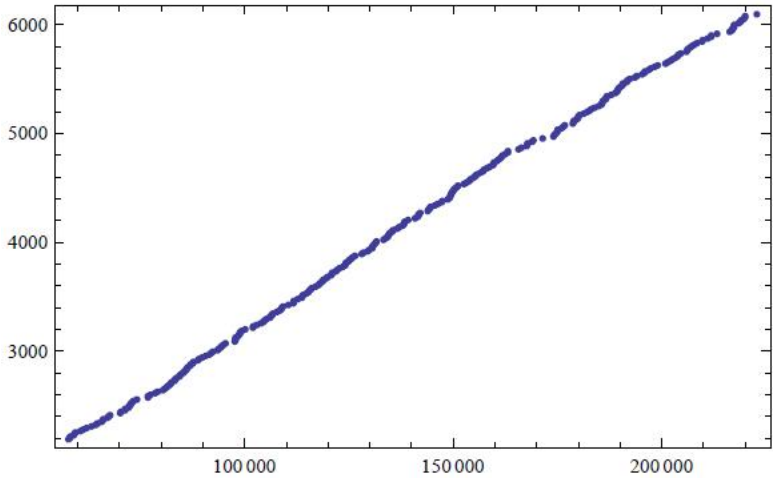
Untersuchen Sie die Häufigkeitsverteilung dieser scf-Primzahlzwillinge verglichen mit der Häufigkeitsverteilung aller Primzahlzwillinge in der Menge der natürlichen Zahlen [3,4].




Häufigkeit dieser Primzahlzwillinge mit prime-scf-Ergebnisnenner im Bereich der natürlichen Zahlen von (5,7) bis (67757, 67759) dargestellt über der Anzahl dieser Primzahlzwillinge




y = [(Anzahl dieser Primzahlzwillinge mit prime-scf-Ergebnisnenner im Bereich der natürlichen Zahlen ≤ x )*lnx] dargestellt über x




Geben Sie hier eine Formel ein.

y = [(Anzahl dieser Primzahlzwillinge mit prime-scf-Ergebnisnenner im Bereich der natürlichen Zahlen ≤ x )*lnx] dargestellt über x; nahezu linearer Bereich, approximierbar durch die Gerade $y = 3800 * \frac{x-60000}{160000} + 2200$

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$$[1;1,1,5,1,1,1] = \frac{57}{37}$$

$$[1;1,1,11,1,1,1] = \frac{111}{73}$$

$$[1;1,1,17,1,1,1] = \frac{165}{109}$$

$$\left\{\left\{5, \frac{57}{37}\right\}, \left\{11, \frac{111}{73}\right\}, \left\{17, \frac{165}{109}\right\}, \left\{29, \frac{273}{181}\right\}, \left\{31, \frac{291}{193}\right\}, \left\{37, \frac{345}{229}\right\}, \left\{61, \frac{561}{373}\right\}, \left\{67, \frac{615}{409}\right\}, \left\{71, \frac{651}{433}\right\}, \left\{89, \frac{813}{541}\right\}, \left\{101, \frac{921}{613}\right\}, \left\{109, \frac{993}{661}\right\}, \left\{127, \frac{1155}{769}\right\}, \left\{137, \frac{1245}{829}\right\}, \left\{167, \frac{1515}{1009}\right\}, \left\{181, \frac{1641}{1093}\right\}, \left\{191, \frac{1731}{1153}\right\}, \left\{199, \frac{1803}{1201}\right\}, \left\{229, \frac{2073}{1381}\right\}, \left\{241, \frac{2181}{1453}\right\}, \left\{257, \frac{2325}{1549}\right\},$$

$$\left\{269, \frac{2433}{1621}\right\}, \left\{277, \frac{2505}{1669}\right\}, \left\{281, \frac{2541}{1693}\right\}, \left\{311, \frac{2811}{1873}\right\}, \left\{331, \frac{2991}{1993}\right\}, \left\{337, \frac{3045}{2029}\right\},$$
$$\left\{347, \frac{3135}{2089}\right\}, \left\{359, \frac{3243}{2161}\right\}, \left\{379, \frac{3423}{2281}\right\}, \left\{389, \frac{3513}{2341}\right\}, \left\{397, \frac{3585}{2389}\right\}, \left\{419, \frac{3783}{2521}\right\},$$
$$\left\{431, \frac{3891}{2593}\right\}, \left\{457, \frac{4125}{2749}\right\}, \left\{491, \frac{4431}{2953}\right\}, \left\{499, \frac{4503}{3001}\right\}, \left\{509, \frac{4593}{3061}\right\}, \left\{541, \frac{4881}{3253}\right\},$$
$$\left\{571, \frac{5151}{3433}\right\}, \left\{577, \frac{5205}{3469}\right\}, \left\{587, \frac{5295}{3529}\right\}, \left\{601, \frac{5421}{3613}\right\}, \left\{617, \frac{5565}{3709}\right\}, \left\{631, \frac{5691}{3793}\right\},$$
$$\left\{641, \frac{5781}{3853}\right\}, \left\{647, \frac{5835}{3889}\right\}, \left\{691, \frac{6231}{4153}\right\}, \left\{709, \frac{6393}{4261}\right\}, \left\{739, \frac{6663}{4441}\right\}, \left\{751, \frac{6771}{4513}\right\},$$
$$\left\{757, \frac{6825}{4549}\right\}, \left\{769, \frac{6933}{4621}\right\}, \left\{787, \frac{7095}{4729}\right\}, \left\{797, \frac{7185}{4789}\right\}, \left\{809, \frac{7293}{4861}\right\}, \left\{821, \frac{7401}{4933}\right\},$$
$$\left\{827, \frac{7455}{4969}\right\}, \left\{907, \frac{8175}{5449}\right\}, \left\{919, \frac{8283}{5521}\right\}, \left\{929, \frac{8373}{5581}\right\}, \left\{941, \frac{8481}{5653}\right\}, \left\{947, \frac{8535}{5689}\right\},$$
$$\left\{977, \frac{8805}{5869}\right\}, \left\{991, \frac{8931}{5953}\right\}, \left\{1019, \frac{9183}{6121}\right\}, \left\{1021, \frac{9201}{6133}\right\}, \left\{1049, \frac{9453}{6301}\right\}, \left\{1061, \frac{9561}{6373}\right\}$$
$$\left\{1069, \frac{9633}{6421}\right\}, \left\{1087, \frac{9795}{6529}\right\}, \left\{1091, \frac{9831}{6553}\right\}, \left\{1109, \frac{9993}{6661}\right\}, \left\{1117, \frac{10\,065}{6709}\right\},$$
$$\left\{1129, \frac{10\,173}{6781}\right\}, \left\{1187, \frac{10\,695}{7129}\right\}, \left\{1201, \frac{10\,821}{7213}\right\}, \left\{1217, \frac{10\,965}{7309}\right\}, \left\{1231, \frac{11\,091}{7393}\right\},$$
$$\left\{1259, \frac{11\,343}{7561}\right\}, \left\{1277, \frac{11\,505}{7669}\right\}, \left\{1279, \frac{11\,523}{7681}\right\}, \left\{1289, \frac{11\,613}{7741}\right\}, \left\{1291, \frac{11\,631}{7753}\right\},$$
$$\left\{1297, \frac{11\,685}{7789}\right\}, \left\{1321, \frac{11\,901}{7933}\right\}, \left\{1367, \frac{12\,315}{8209}\right\}, \left\{1381, \frac{12\,441}{8293}\right\}, \left\{1409, \frac{12\,693}{8461}\right\},$$
$$\left\{1429, \frac{12\,873}{8581}\right\}, \left\{1439, \frac{12\,963}{8641}\right\}, \left\{1447, \frac{13\,035}{8689}\right\}, \left\{1451, \frac{13\,071}{8713}\right\}, \left\{1459, \frac{13\,143}{8761}\right\},$$
$$\left\{1481, \frac{13\,341}{8893}\right\}, \left\{1487, \frac{13\,395}{8929}\right\}, \left\{1489, \frac{13\,413}{8941}\right\}, \left\{1499, \frac{13\,503}{9001}\right\}, \left\{1571, \frac{14\,151}{9433}\right\},$$
$$\left\{1601, \frac{14\,421}{9613}\right\}, \left\{1607, \frac{14\,475}{9649}\right\}, \left\{1609, \frac{14\,493}{9661}\right\}, \left\{1619, \frac{14\,583}{9721}\right\}, \left\{1621, \frac{14\,601}{9733}\right\},$$
$$\left\{1627, \frac{14\,655}{9769}\right\}, \left\{1637, \frac{14\,745}{9829}\right\}, \left\{1657, \frac{14\,925}{9949}\right\}, \left\{1667, \frac{15\,015}{10\,009}\right\}, \left\{1721, \frac{15\,501}{10\,333}\right\},$$
$$\left\{1741, \frac{15\,681}{10\,453}\right\}, \left\{1787, \frac{16\,095}{10\,729}\right\}, \left\{1831, \frac{16\,491}{10\,993}\right\}, \left\{1861, \frac{16\,761}{11\,173}\right\}, \left\{1931, \frac{17\,391}{11\,593}\right\},$$
$$\left\{1949, \frac{17\,553}{11\,701}\right\}, \left\{2011, \frac{18\,111}{12\,073}\right\}, \left\{2017, \frac{18\,165}{12\,109}\right\}, \left\{2039, \frac{18\,363}{12\,241}\right\}, \left\{2069, \frac{18\,633}{12\,421}\right\},$$
$$\left\{2089, \frac{18\,813}{12\,541}\right\}, \left\{2099, \frac{18\,903}{12\,601}\right\}, \left\{2129, \frac{19\,173}{12\,781}\right\}, \left\{2137, \frac{19\,245}{12\,829}\right\}, \left\{2141, \frac{19\,281}{12\,853}\right\},$$
$$\left\{2161, \frac{19\,461}{12\,973}\right\}, \left\{2207, \frac{19\,875}{13\,249}\right\}, \left\{2239, \frac{20\,163}{13\,441}\right\}, \left\{2251, \frac{20\,271}{13\,513}\right\}, \left\{2281, \frac{20\,541}{13\,693}\right\},$$
$$\left\{2287, \frac{20\,595}{13\,729}\right\}, \left\{2297, \frac{20\,685}{13\,789}\right\}, \left\{2311, \frac{20\,811}{13\,873}\right\}, \left\{2357, \frac{21\,225}{14\,149}\right\}, \left\{2381, \frac{21\,441}{14\,293}\right\},$$
$$\left\{2389, \frac{21\,513}{14\,341}\right\}, \left\{2399, \frac{21\,603}{14\,401}\right\}, \left\{2437, \frac{21\,945}{14\,629}\right\}, \left\{2441, \frac{21\,981}{14\,653}\right\}, \left\{2477, \frac{22\,305}{14\,869}\right\},$$

↓ …

Untersuchen Sie die Häufigkeitsverteilung dieser scf-Primzahlen in der Menge der natürlichen Zahlen und vergleichen Sie mit der Primzahlfunktion π(x) [1,2].

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$$[1;5,1,1,1,5,1] = \frac{133}{113}$$

$$[1;7,1,1,1,7,1] = \frac{225}{199}$$

$$[1;11,1,1,1,11,1] = \frac{481}{443}$$

$$[1;13,1,1,1,13,1] = \frac{645}{601}$$

$$\left\{5, \frac{133}{113}\right\}, \left\{7, \frac{225}{199}\right\}, \left\{11, \frac{481}{443}\right\}, \left\{13, \frac{645}{601}\right\}, \left\{29, \frac{2821}{2729}\right\}, \left\{41, \frac{5461}{5333}\right\}, \left\{43, \frac{5985}{5851}\right\},$$
$$\left\{47, \frac{7105}{6959}\right\}, \left\{59, \frac{11\,041}{10\,859}\right\}, \left\{61, \frac{11\,781}{11\,593}\right\}, \left\{97, \frac{29\,205}{28\,909}\right\}, \left\{107, \frac{35\,425}{35\,099}\right\}, \left\{127, \frac{49\,665}{49\,279}\right\},$$
$$\left\{137, \frac{57\,685}{57\,269}\right\}, \left\{151, \frac{69\,921}{69\,463}\right\}, \left\{179, \frac{97\,921}{97\,379}\right\}, \left\{197, \frac{118\,405}{117\,809}\right\}, \left\{199, \frac{120\,801}{120\,199}\right\},$$
$$\left\{211, \frac{135\,681}{135\,043}\right\}, \left\{239, \frac{173\,761}{173\,039}\right\}, \left\{251, \frac{191\,521}{190\,763}\right\}, \left\{269, \frac{219\,781}{218\,969}\right\}, \left\{277, \frac{232\,965}{232\,129}\right\},$$
$$\left\{281, \frac{239\,701}{238\,853}\right\}, \left\{307, \frac{285\,825}{284\,899}\right\}, \left\{311, \frac{293\,281}{292\,343}\right\}, \left\{317, \frac{304\,645}{303\,689}\right\}, \left\{347, \frac{364\,705}{363\,659}\right\},$$
$$\left\{349, \frac{368\,901}{367\,849}\right\}, \left\{373, \frac{421\,125}{420\,001}\right\}, \left\{419, \frac{530\,881}{529\,619}\right\}, \left\{439, \frac{582\,561}{581\,239}\right\}, \left\{461, \frac{642\,181}{640\,793}\right\},$$
$$\left\{467, \frac{658\,945}{657\,539}\right\}, \left\{487, \frac{716\,385}{714\,919}\right\}, \left\{509, \frac{782\,341}{780\,809}\right\}, \left\{541, \frac{883\,461}{881\,833}\right\}, \left\{563, \frac{956\,545}{954\,851}\right\},$$
$$\left\{587, \frac{1\,039\,585}{1\,037\,819}\right\}, \left\{631, \frac{1\,200\,801}{1\,198\,903}\right\}, \left\{647, \frac{1\,262\,305}{1\,260\,359}\right\}, \left\{691, \frac{1\,439\,361}{1\,437\,283}\right\}, \left\{701, \frac{1\,481\,221}{1\,479\,113}\right\},$$
$$\left\{719, \frac{1\,558\,081}{1\,555\,919}\right\}, \left\{739, \frac{1\,645\,761}{1\,643\,539}\right\}, \left\{757, \frac{1\,726\,725}{1\,724\,449}\right\}, \left\{773, \frac{1\,800\,325}{1\,798\,001}\right\},$$
$$\left\{797, \frac{1\,913\,605}{1\,911\,209}\right\}, \left\{821, \frac{2\,030\,341}{2\,027\,873}\right\}, \left\{823, \frac{2\,040\,225}{2\,037\,751}\right\}, \left\{829, \frac{2\,070\,021}{2\,067\,529}\right\},$$
$$\left\{863, \frac{2\,242\,945}{2\,240\,351}\right\}, \left\{929, \frac{2\,598\,421}{2\,595\,629}\right\}, \left\{947, \frac{2\,699\,905}{2\,697\,059}\right\}, \left\{971, \frac{2\,838\,241}{2\,835\,323}\right\},$$
$$\left\{977, \frac{2\,873\,365}{2\,870\,429}\right\}, \left\{991, \frac{2\,956\,161}{2\,953\,183}\right\}, \left\{997, \frac{2\,992\,005}{2\,989\,009}\right\}, \left\{1013, \frac{3\,088\,645}{3\,085\,601}\right\},$$
$$\left\{1019, \frac{3\,125\,281}{3\,122\,219}\right\}, \left\{1033, \frac{3\,211\,605}{3\,208\,501}\right\}, \left\{1051, \frac{3\,324\,321}{3\,321\,163}\right\}, \left\{1061, \frac{3\,387\,781}{3\,384\,593}\right\},$$
$$\left\{1063, \frac{3\,400\,545}{3\,397\,351}\right\}, \left\{1069, \frac{3\,438\,981}{3\,435\,769}\right\}, \left\{1109, \frac{3\,700\,741}{3\,697\,409}\right\}, \left\{1181, \frac{4\,196\,101}{4\,192\,553}\right\},$$
$$\left\{1229, \frac{4\,543\,621}{4\,539\,929}\right\}, \left\{1237, \frac{4\,602\,885}{4\,599\,169}\right\}, \left\{1277, \frac{4\,904\,965}{4\,901\,129}\right\}, \left\{1283, \frac{4\,951\,105}{4\,947\,251}\right\},$$
$$\left\{1297, \frac{5\,059\,605}{5\,055\,709}\right\}, \left\{1321, \frac{5\,248\,341}{5\,244\,373}\right\}, \left\{1367, \frac{5\,619\,745}{5\,615\,639}\right\}, \left\{1381, \frac{5\,735\,301}{5\,731\,153}\right\},$$
$$\left\{1409, \frac{5\,969\,941}{5\,965\,709}\right\}, \left\{1427, \frac{6\,123\,265}{6\,118\,979}\right\}, \left\{1433, \frac{6\,174\,805}{6\,170\,501}\right\}, \left\{1453, \frac{6\,348\,165}{6\,343\,801}\right\},$$
$$\left\{1459, \frac{6\,400\,641}{6\,396\,259}\right\}, \left\{1471, \frac{6\,506\,241}{6\,501\,823}\right\}, \left\{1487, \frac{6\,648\,385}{6\,643\,919}\right\}, \left\{1511, \frac{6\,864\,481}{6\,859\,943}\right\},$$
$$\left\{1531, \frac{7\,047\,201}{7\,042\,603}\right\}, \left\{1571, \frac{7\,419\,841}{7\,415\,123}\right\}, \left\{1619, \frac{7\,879\,681}{7\,874\,819}\right\}, \left\{1667, \frac{8\,353\,345}{8\,348\,339}\right\},$$
$$\left\{1693, \frac{8\,615\,685}{8\,610\,601}\right\}, \left\{1709, \frac{8\,779\,141}{8\,774\,009}\right\}, \left\{1733, \frac{9\,027\,205}{9\,022\,001}\right\}, \left\{1741, \frac{9\,110\,661}{9\,105\,433}\right\},$$
$$\left\{1747, \frac{9\,173\,505}{9\,168\,259}\right\}, \left\{1753, \frac{9\,236\,565}{9\,231\,301}\right\}, \left\{1787, \frac{9\,597\,985}{9\,592\,619}\right\}, \left\{1867, \frac{10\,475\,745}{10\,470\,139}\right\},$$

$$\left\{1879, \frac{10\,610\,721}{10\,605\,079}\right\}, \left\{1889, \frac{10\,723\,861}{10\,718\,189}\right\}, \left\{1913, \frac{10\,997\,845}{10\,992\,101}\right\}, \left\{1933, \frac{11\,228\,805}{11\,223\,001}\right\},$$
$$\left\{1999, \frac{12\,008\,001}{12\,001\,999}\right\}, \left\{2017, \frac{12\,225\,045}{12\,218\,989}\right\}, \left\{2053, \frac{12\,664\,965}{12\,658\,801}\right\}, \left\{2099, \frac{13\,238\,401}{13\,232\,099}\right\},$$
$$\left\{2113, \frac{13\,415\,445}{13\,409\,101}\right\}, \left\{2143, \frac{13\,798\,785}{13\,792\,351}\right\}, \left\{2207, \frac{14\,634\,625}{14\,627\,999}\right\}, \left\{2221, \frac{14\,820\,741}{14\,814\,073}\right\},$$
$$\left\{2251, \frac{15\,223\,521}{15\,216\,763}\right\}, \left\{2287, \frac{15\,713\,985}{15\,707\,119}\right\}, \left\{2297, \frac{15\,851\,605}{15\,844\,709}\right\}, \left\{2347, \frac{16\,548\,705}{16\,541\,659}\right\},$$
$$\left\{2371, \frac{16\,888\,641}{16\,881\,523}\right\}, \left\{2377, \frac{16\,974\,165}{16\,967\,029}\right\}, \left\{2389, \frac{17\,145\,861}{17\,138\,689}\right\}, \left\{2423, \frac{17\,637\,025}{17\,629\,751}\right\},$$
$$\left\{2447, \frac{17\,987\,905}{17\,980\,559}\right\}, \left\{2477, \frac{18\,431\,365}{18\,423\,929}\right\}, \left\{2531, \frac{19\,243\,201}{19\,235\,603}\right\}, \left\{2551, \frac{19\,548\,321}{19\,540\,663}\right\},$$
$$\left\{2591, \frac{20\,165\,761}{20\,157\,983}\right\}, \left\{2609, \frac{20\,446\,741}{20\,438\,909}\right\}, \left\{2617, \frac{20\,572\,245}{20\,564\,389}\right\}, \left\{2663, \frac{21\,301\,345}{21\,293\,351}\right\},$$
$$\left\{2719, \frac{22\,206\,081}{22\,197\,919}\right\}, \left\{2753, \frac{22\,764\,565}{22\,756\,301}\right\}, \left\{2803, \frac{23\,598\,465}{23\,590\,051}\right\}, \left\{2851, \frac{24\,413\,121}{24\,404\,563}\right\},$$
$$\left\{2897, \frac{25\,206\,805}{25\,198\,109}\right\}, \left\{2903, \frac{25\,311\,265}{25\,302\,551}\right\}, \left\{2909, \frac{25\,415\,941}{25\,407\,209}\right\}, \left\{2969, \frac{26\,474\,581}{26\,465\,669}\right\},$$
$$\left\{3011, \frac{27\,228\,481}{27\,219\,443}\right\}, \left\{3037, \frac{27\,700\,485}{27\,691\,369}\right\}, \left\{3061, \frac{28\,139\,781}{28\,130\,593}\right\}, \left\{3067, \frac{28\,250\,145}{28\,240\,939}\right\},$$
$$\left\{3079, \frac{28\,471\,521}{28\,462\,279}\right\}, \left\{3187, \frac{30\,502\,785}{30\,493\,219}\right\}, \left\{3217, \frac{31\,079\,445}{31\,069\,789}\right\}, \left\{3229, \frac{31\,311\,621}{31\,301\,929}\right\},$$
$$\left\{3257, \frac{31\,856\,725}{31\,846\,949}\right\}, \left\{3307, \frac{32\,841\,825}{32\,831\,899}\right\}, \left\{3313, \frac{32\,961\,045}{32\,951\,101}\right\}, \left\{3323, \frac{33\,160\,225}{33\,150\,251}\right\},$$
$$\left\{3343, \frac{33\,560\,385}{33\,550\,351}\right\}, \left\{3347, \frac{33\,640\,705}{33\,630\,659}\right\}, \left\{3361, \frac{33\,922\,581}{33\,912\,493}\right\}, \left\{3373, \frac{34\,165\,125}{34\,155\,001}\right\},$$
$$\left\{3391, \frac{34\,530\,561}{34\,520\,383}\right\}, \left\{3533, \frac{37\,481\,605}{37\,471\,001}\right\}, \left\{3557, \frac{37\,992\,325}{37\,981\,649}\right\}, \left\{3581, \frac{38\,506\,501}{38\,495\,753}\right\},$$
$$\left\{3617, \frac{39\,284\,245}{39\,273\,389}\right\}, \left\{3637, \frac{39\,719\,685}{39\,708\,769}\right\}, \left\{3659, \frac{40\,201\,441}{40\,190\,459}\right\}, \left\{3673, \frac{40\,509\,525}{40\,498\,501}\right\},$$
$$\left\{3677, \frac{40\,597\,765}{40\,586\,729}\right\}, \left\{3691, \frac{40\,907\,361}{40\,896\,283}\right\}, \left\{3761, \frac{42\,472\,981}{42\,461\,693}\right\}, \left\{3767, \frac{42\,608\,545}{42\,597\,239}\right\},$$
$$\left\{3803, \frac{43\,426\,465}{43\,415\,051}\right\}, \left\{3821, \frac{43\,838\,341}{43\,826\,873}\right\}, \left\{3833, \frac{44\,114\,005}{44\,102\,501}\right\}, \left\{3851, \frac{44\,529\,121}{44\,517\,563}\right\},$$
$$\left\{3853, \frac{44\,575\,365}{44\,563\,801}\right\}, \left\{3863, \frac{44\,806\,945}{44\,795\,351}\right\}, \left\{3889, \frac{45\,411\,861}{45\,400\,189}\right\}, \left\{3911, \frac{45\,926\,881}{45\,915\,143}\right\},$$
$$\left\{3919, \frac{46\,114\,881}{46\,103\,119}\right\}, \left\{4003, \frac{48\,112\,065}{48\,100\,051}\right\}, \left\{4007, \frac{48\,208\,225}{48\,196\,199}\right\}, \left\{4013, \frac{48\,352\,645}{48\,340\,601}\right\},$$
$$\left\{4027, \frac{48\,690\,465}{48\,678\,379}\right\}, \left\{4093, \frac{50\,298\,885}{50\,286\,601}\right\}, \left\{4127, \frac{51\,137\,665}{51\,125\,279}\right\}, \left\{4217, \frac{53\,391\,445}{53\,378\,789}\right\},$$
$$\left\{4241, \frac{54\,000\,661}{53\,987\,933}\right\}, \left\{4243, \frac{54\,051\,585}{54\,038\,851}\right\}, \left\{4283, \frac{55\,075\,105}{55\,062\,251}\right\}, \left\{4339, \frac{56\,524\,161}{56\,511\,139}\right\},$$
$$\left\{\quad, \frac{57\,413\,125}{\quad}\right\}, \left\{\quad, \frac{59\,478\,721}{\quad}\right\}, \left\{\quad, \frac{59\,799\,745}{\quad}\right\}, \left\{\quad, \frac{60\,606\,085}{\quad}\right\},$$

↓ …

Untersuchen Sie die Häufigkeitsverteilung dieser scf-Primzahlen in der Menge der natürlichen Zahlen und vergleichen Sie mit der Primzahlfunktion π(x) [1,2].

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References

[1] http://mathworld.wolfram.com/PrimeCountingFunction.html
[2] https://de.wikipedia.org/wiki/Primzahlsatz
[3] http://mathworld.wolfram.com/TwinPrimes.html
[4] https://de.wikipedia.org/wiki/Primzahlzwilling

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**Sandbox zur Diskussion**
**„Immer noch einmal 1089“**
**Bisher**
** Unit 15, part 76.9, S. 3-4
** Unit 15, part 76.9 Besun, S. 1
** Unit 15, part 76.9 extended, S. 5-14
**Aktuell**
Transformation dreistelliger nichtpalindromischer natürlicher Zahlen
xy7 und xy9 ; x≠8 (1)
Beispiel 1, Primzahlzwillinge

$$T(617,619) = 0.5*\{+916 \quad +716$$
$$\underline{-617} \quad \underline{-619}$$
$$+299 \quad +097$$
$$\underline{+992} \quad \underline{+709}$$
$$1291_{prim} + 887_{prim}\} = 1089$$

Beispiel 2

$$T(507,509) = 0.5*\{+905 \quad +705$$

-507 -509
+398 +196
+893 +691
1291 + 887} = 1089

Beispiel 3

T(057,059) = 0.5*{+950 +750
-057 -059
+893 +691
+398 +196
1291 + 887} = 1089

Beispiel 4

T(007,009) = 0.5*{+900 +700
-007 -009
+893 +691
+398 +196
1291 + 887} = 1089

xy1 und xy3 ; x≠2 (2)

Beispiel 5

T(451,453) = 0.5*{+451 +453
-354 -154
+097 +299
+790 +992
887 + 1291} = 1089

Beispiel 6

T(061,063) = 0.5*{+360 +705
-061 -509
+199 +196
+893 +691
1291 + 887} = 1089

Beispiel 7

T(601,603) = 0.5*{-306 -106
+601 +603
+295 +497
+592 +794
887 + 1291} = 1089

Beispiel 8

T(001,003) = 0.5*{+300 +100
-001 -003
+299 +097
+992 +790
1291 + 887} = 1089

Verallgemeinerung, Diskussion.

$1089 = 65^2 - 56^2 = (9^2 - 4^2)^2 - (9^2 - 5^2)^2$

$$= \begin{vmatrix} 65 & 56 \\ 56 & 65 \end{vmatrix}$$

$$= \begin{vmatrix} 16 & 0 & 81 & 0 & 25 & 0 \\ 0 & 16 & 0 & 25 & 0 & 81 \end{vmatrix}$$

$$= \begin{vmatrix} 4^2 & 0 & (4+5)^2 & 0 & 5^2 & 0 \\ 0 & 4^2 & 0 & 5^2 & 0 & (4+5)^2 \end{vmatrix}$$

$$= \begin{vmatrix} 5^2 & 4^2 \\ 4^2 & 5^2 \end{vmatrix} + 5 \begin{vmatrix} 4^2 & 4^2 \\ 4^2 & 5^2 \end{vmatrix} = \frac{5445}{5}$$

$= 32*34 + 1 = 23*43 + 100$

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**Unit 189**, in Bearbeitung

**Zweidimensionale Arrays, Zusammenschau**

**Math**ematik

** Matrix

** Determinante

** „Innere Determinantenoperationen“ (siehe Unit 47)

** Verkürzte Determinante (siehe Unit 19)

** Permanente

** Magisches Quadrat

**Werk**kunst

** Weaving, operations, methods, patterns

** Stricktechniken, Strickmuster

** Flechttechniken, Flechtmuster

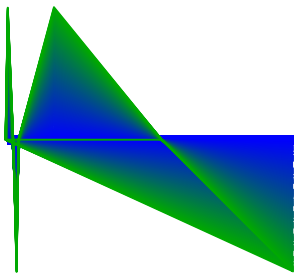
** Geometric patterns from tiles and brickwork

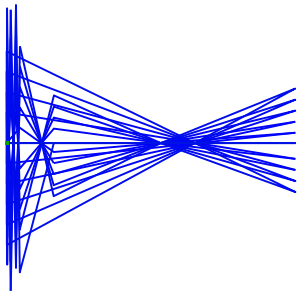
** Celtic, Islamic, Chinese, … pattern

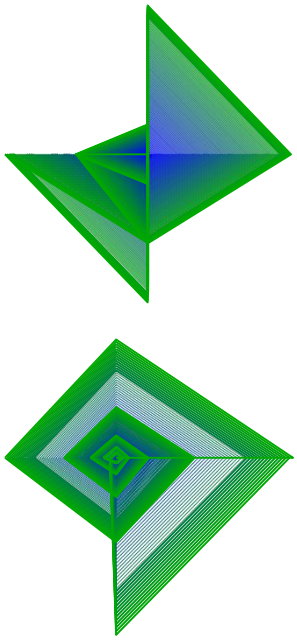
**VLSI**-Strukturen

**Mole**kül- und Kristallstrukturen

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22.02.2019 EPScoll.alg DScalc.mathematica