Smarandache Factors and Reverse Factors

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Abstract

This document will describe the current status on the search for factors of Smarandache consecutive numbers and their reverse. A complete list up to index 200 will be given, with all known factors. Smarandache numbers are the concatenation of the natural numbers from one up to the given index, and reverse Smarandache numbers are the concatenation of the natural numbers from the given index down to 1.

1 Introduction

As a followup to Ralf Stephan's article in this journal [St], I decided to extend his factorizations to index 200. The Smarandache consecutive sequence, as well as their reverse is described in [Sm]. In this article Sm11 denotes 1234567891011 for example, and Rsm11 denotes 1110987654321.

Most of the factors that have been found by me and others, have been found by using the elliptic curve method (ECM) [Le], some have been found using the Multiple Polynomial Quadratic Sieve (MPQS) [Si].

All factors and remaining cofactors have been proven prime or composite by means of Elliptic Curve Primality Proving (ECPP) [At], or the Adleman-Pomerance-Rumely test [Ad], which has been simplified in 1984 by Cohen and Lenstra [Co].

2 Software used

The main factoring program used has been `GMP-ECM` by Paul Zimmermann [Zi, Le, Gr]. The first small factors were filtered out quickly by `ECMX`, a program of the `UBASIC` package [Ki, Le].

The factors which were probably prime were then tested with François Morain's ECPP [Mo, At]. Some factors have been proven prime by use of APRT-CLE [Ad] from the UBASIC package [Ki].

All these fine pieces of software are freely available from the internet. The appropriate adresses are enlisted in the references.

3 Progress of calculations

All numbers have been factored using GMP-ECM up to 20 digits. First 25 runs with $B1 = 2000$ were run, and if the factorization wasn't complete, 90 runs with $B1 = 11000$ were run.

Work is in progress to extend this to 25 digits. Some factors have already been tried to 25 digits (300 curves with $B1 = 50000$). For more detail on the progress check the following URL:
http://www.sci.kun.nl/sigma/Persoonlijk/michaf/ecm/ecmtries.html
Currently the lowest not-completely factored numbers are Sm63 and Rsm59.

4 Factorization results

The lists presented here are an up to date representation of the factors known so far. When more factors are found they will be added to the list, which can be found on the internet at the following URL:
http://www.sci.kun.nl/sigma/Persoonlijk/michaf/ecm/

Most of the factors up to Sm80 and Rsm80 should be creditted to Ralf Stephan. (unless otherwise stated). All contributors, together with their email-adresses can be found in tables 1 and 3.

A '*' denotes an uncomplete factorization, pxx denotes a prime of xx digits and cxx denotes a composite number of xx digits.

4.1 Smarandache Factors

Contributors of Smarandache factors		
RB	Robert Backstrom	bobb@atinet.com.au
TC	Tim Charron	tcharron@interlog.com
BD	Bruce Dodson	bad0@lehigh.edu
MF	Micha Fleuren	michaf@sci.kun.nl

AM	Allan MacLeod	MACL-MS0@wpmail.paisley.ac.uk
RS	Ralf Stephan	stephan@tmt.de
EW	Egon Willighagen	egonw@sci.kun.nl
PZ	Paul Zimmermann	zimmerma@loria.fr (LORIA, Nancy, France)

Table 1: Contributors of Smarandache factors

n	Factors of Sm(n)
2	$2^2 \cdot 3$
3	$3 \cdot 41$
4	$2 \cdot 617$
5	$3 \cdot 5 \cdot 823$
6	$2^6 \cdot 3 \cdot 643$
7	$127 \cdot 9721$
8	$2 \cdot 3^2 \cdot 47 \cdot 14593$
9	$3^2 \cdot 3607 \cdot 3803$
10	$2 \cdot 5 \cdot 1234567891$
11	$3 \cdot 7 \cdot 13 \cdot 67 \cdot 107 \cdot 630803$
12	$2^3 \cdot 3 \cdot 2437 \cdot 2110805449$
13	$113 \cdot 125693 \cdot 869211457$
14	$2 \cdot 3$
	$p18 : 205761315168520219$
15	$3 \cdot 5$
	$p19 : 8230452606740808761$
16	2^2
	$p10 : 2507191691$
	$p13 : 1231026625769$
17	$3^2 \cdot 47 \cdot 4993$
	$p18 : 584538396786764503$
18	$2 \cdot 3^2 \cdot 97 \cdot 88241$
	$p18 : 801309546900123763$
19	$13 \cdot 43 \cdot 79 \cdot 281 \cdot 1193$
	$p18 : 833929457045867563$
20	$2^5 \cdot 3 \cdot 5 \cdot 323339 \cdot 3347983$
	$p16 : 2375923237887317$
21	$3 \cdot 17 \cdot 37 \cdot 43 \cdot 103 \cdot 131 \cdot 140453$
	$p18 : 802851238177109689$
22	$2 \cdot 7 \cdot 1427 \cdot 3169 \cdot 85829$
	continued...

n	Factors of Sm(n)
	$p22$: 2271991367799686681549
23	$3 \cdot 41 \cdot 769$
	$p32$: 13052194181136110820214375991629
24	$2^2 \cdot 3 \cdot 7$
	$p18$: 978770977394515241
	$p19$: 1501601205715706321
25	$5^2 \cdot 15461$
	$p11$: 31309647077
	$p25$: 1020138683879280489689401
26	$2 \cdot 3^4 \cdot 21347 \cdot 2345807$
	$p12$: 982658598563
	$p18$: 154870313069150249
27	$3^3 \cdot 19^2 \cdot 4547 \cdot 68891$
	$p32$: 40434918154163992944412000742833
28	$2^3 \cdot 47 \cdot 409$
	$p15$: 416603295903037
	$p27$: 192699737522238137890605091
29	$3 \cdot 859$
	$p20$: 24526282862310130729
	$p26$: 19532994432886141889218213
30	$2 \cdot 3 \cdot 5 \cdot 13 \cdot 49269439$
	$p18$: 370677592383442753
	$p23$: 17333107067824345178861
31	29
	$p10$: 2597152967
	$p42$: 163915283880121143989433769727058554332117
32	$2^2 \cdot 3 \cdot 7$
	$p23$: 45068391478912519182079
	$p30$: 326109637274901966196516045637
33	$3 \cdot 23 \cdot 269 \cdot 7547$
	$p18$: 116620853190351161
	$p31$: 7557237004029029700530634132859
34	2
	$p50$: 61728394550556065707580859096010611162126313641465156616 67
35	$3^2 \cdot 5 \cdot 139 \cdot 151 \cdot 64279903$
	$p10$: 4462548227
	$p37$: 4556722495899317991381926119681186927
36	$2^4 \cdot 3^2 \cdot 103 \cdot 211$
	$p56$

continued...

n	Factors of Sm(n)
37	$71 \cdot 12379 \cdot 4616929$
	$p52$
38	$2 \cdot 3$
	$p23$: 86893956354189878775643
	$p43$: 2367958875411463048104007458352976869124861
39	$3 \cdot 67 \cdot 311 \cdot 1039$
	$p25$: 6216157781332031799688469
	$p36$: 305788363093026251381516836994235539
40	$2^2 \cdot 5 \cdot 3169 \cdot 60757 \cdot 579779$
	$p10$: 4362289433
	$p20$: 79501124416220680469
	$p26$: 15944694111943672435829023
41	$3 \cdot 487 \cdot 493127 \cdot 32002651$
	$p56$
42	$2 \cdot 3 \cdot 127 \cdot 421$
	$p11$: 22555732187
	$p25$: 4562371492227327125110177
	$p34$: 3739644646350764691998599898592229
43	$7 \cdot 17 \cdot 449$
	$p72$
44	$2^3 \cdot 3^2$
	$p26$: 12797571009458074720816277
	$p52$
45	$3^2 \cdot 5 \cdot 7 \cdot 41 \cdot 727 \cdot 1291$
	$p13$: 2634831682519
	$p18$: 379655178169650473
	$p41$: 10181639342830457495311038751840866580037
46	$2 \cdot 31 \cdot 103 \cdot 270408101$
	$p18$: 374332796208406291
	$p25$: 3890951821355123413169209
	$p28$: 4908543378923330485082351119
47	$3 \cdot 4813 \cdot 679751$
	$p22$: 4626659581180187993501
	$p53$
48	$2^2 \cdot 3 \cdot 179 \cdot 1493 \cdot 1894439$
	$p29$: 15771940624188426710323588657
	$p46$: 1288413105003100659990273192963354903752853409
49	$23 \cdot 109 \cdot 3251653$
	$p10$: 2191196713
	continued...

n	Factors of Sm(n)
	$p23$: 53481597817014258108937
	$p47$: 12923219128084505550382930974691083231834648599
50	$2 \cdot 3 \cdot 5^2 \cdot 13 \cdot 211 \cdot 20479$
	$p18$: 160189818494829241
	$p20$: 46218039785302111919
	$p44$: 19789860528346995527543912534464764790909391
51	3
	$p20$: 17708093685609923339
	$p73$
52	2^7
	$p17$: 43090793230759613
	$p76$
53	$3^3 \cdot 7^3$
	$p18$: 127534541853151177
	$p76$
54	$2 \cdot 3^6 \cdot 79 \cdot 389 \cdot 3167 \cdot 13309$
	$p11$: 69526661707
	$p22$: 8786705495566261913717
	$p51$
55	$5 \cdot 768643901$
	$p15$: 641559846437453
	$p22$: 1187847380143694126117
	$p55$
56	$2^2 \cdot 3$
	$p25$: 4324751743617631024407823 (BD)
	$p77$
57	$3 \cdot 17 \cdot 36769067$
	$p13$: 2205251248721
	$p37$: 2128126623795388466914401931224151279 (RB)
	$p47$: 14028351843196901173601082244449305344230057319
58	$2 \cdot 13$
	$p31$: 1448595612076564044790098185437 (BD)
	$p75$
59	3
	$p18$: 340038104073949513
	$p36$: 324621819487091567830636828971096713 (RB)
	$p55$
60	$2^3 \cdot 3 \cdot 5 \cdot 97 \cdot 157$
	$p103$
	continued...

n	Factors of Sm(n)
61	10386763
	$p14$: 35280457769357
	$p92$
62	$2 \cdot 3^2 \cdot 1709 \cdot 329167 \cdot 1830733$
	$p34$: 9703956232921821226401223348541281(TC)
	$p64$
63*	3^2
	$p11$: 17028095263
	$c105$
64	$2^2 \cdot 7 \cdot 17 \cdot 19 \cdot 197 \cdot 522673$
	$p19$: 1072389445090071307
	$p29$: 20203723083803464811983788589 (PW)
	$p60$
65*	$3 \cdot 5 \cdot 31 \cdot 83719$
	$c113$
66*	$2 \cdot 3 \cdot 7 \cdot 20143 \cdot 971077$
	$c111$
67	397
	$p18$: 183783139772372071
	$p105$
68*	$2^4 \cdot 3 \cdot 23 \cdot 764558869$
	$p10$: 1811890921
	$c105$
69	$3 \cdot 13 \cdot 23$
	$p22$: 8684576204660284317187
	$p24$: 281259608597535749175083
	$p32$: 15490495288652004091050327089107 (RB)
	$p49$: 3637485176043309178386946614318767365372143115591
70	$2 \cdot 5 \cdot 2411111$
	$p24$: 109315518091391293936799
	$p41$: 11555516101313335177332236222295571524323
	$p60$
71	$3^2 \cdot 83 \cdot 2281$
	$p31$: 7484379467407391660418419352839 (AM)
	$p95$
72	$2^2 \cdot 3^2 \cdot 5119$
	$p27$: 596176870295201674946617769 (BD)
	$p103$
73*	37907
	continued...

n	Factors of $\mathrm{Sm}(n)$
	$c132$
74	$2 \cdot 3 \cdot 7 \cdot 1788313 \cdot 21565573$
	$p20$: 99014155049267797799
	$p25$: 1634187291640507800518363 (PW)
	$p31$: 1981231397449722872290863561307
	$p49$: 2377534541508613492655260491688014802698908815817
75*	$3 \cdot 5^2 \cdot 193283$
	$c133$
76	2^3
	$p18$: 828699354354766183
	$p27$: 213643895352490047310058981
	$p97$
77	3
	$p24$: 383481022289718079599637 (PW)
	$p24$: 874911832937988998935021
	$p39$: 164811751226239402858361187055939797929 (RB)
	$p58$
78*	$2 \cdot 3 \cdot 31 \cdot 185897$
	$c139$
79*	$73 \cdot 137$
	$p20$: 22683534613064519783
	$p24$: 132316335833889742191773
	$c102$
80	$2^2 \cdot 3^3 \cdot 5 \cdot 101 \cdot 10263751$
	$p25$: 1295331340195453366408489
	$p115$
81	$3^3 \cdot 509$
	$p30$: 152873624211113444108313548197 (AM)
	$p119$
82*	$2 \cdot 29 \cdot 4703 \cdot 10091$
	$p35$: 12295349967251726424104854676730107 (AM)
	$c111$
83*	$3 \cdot 53 \cdot 503$
	$p18$: 177918442980303859 (MF)
	$c134$
84	$2^5 \cdot 3$
	$p157$
85*	$5 \cdot 7^2$
	$c158$
	continued...

n	Factors of Sm(n)
86*	$2 \cdot 3 \cdot 23 \cdot 1056149$
	$c155$
87*	$3 \cdot 7 \cdot 231330259$
	$p10 : 4275444601$ (MF)
	$c145$
88*	2^2
	$p14 : 12414068351873$ (MF)
	$c153$
89*	$3 \cdot 3 \cdot 13 \cdot 31 \cdot 97 \cdot 163060459$
	$p18 : 789841356493369879$ (MF)
	$c137$
90*	$2 \cdot 3 \cdot 3 \cdot 5 \cdot 1987 \cdot 179827 \cdot 2166457$
	$c154$
91*	$37 \cdot 607$
	$p16 : 5713601747802353$ (MF)
	$p24 : 100397446615566314002487$ (MF)
	$c130$
92*	$2^3 \cdot 3 \cdot 75503$
	$c168$
93*	$3 \cdot 73 \cdot 1051$
	$p10 : 3298142203$ (MF)
	$c162$
94*	$2 \cdot 12871181$
	$p11 : 98250285823$ (MF)
	$c160$
95*	$3 \cdot 5 \cdot 7 \cdot 401$
	$c176$
96	$2 \cdot 2 \cdot 3 \cdot 23 \cdot 60331$
	$p175$
97	13
	$p183$
98*	$2 \cdot 3^2 \cdot 23 \cdot 37 \cdot 199$
	$p16 : 1495444452918817$ (MF)
	$c165$
99*	$3^2 \cdot 31601$
	$p12 : 786576340181$ (MF)
	$c171$
100*	$2^2 \cdot 5^2 \cdot 7^3 \cdot 8171 \cdot 1065829$
	$p10 : 2824782749$ (AM)

continued...

n	Factors of Sm(n)
	$p20$: 20317177407273276661 (MF)
	$c149$
101*	$3 \cdot 8377$
	$p21$: 799917088062980754649 (AM)
	$c169$
102	$2 \cdot 3 \cdot 19 \cdot 89 \cdot 3607 \cdot 15887 \cdot 32993$
	$p10$: 2865523753 (MF)
	$p172$
103*	$131 \cdot 1231$
	$p16$: 1713675826579469 (MF)
	$c180$
104*	$2^6 \cdot 3 \cdot 59 \cdot 773$
	$p20$: 19601852982312892289 (AM)
	$c177$
105*	$3 \cdot 5 \cdot 193$
	$p13$: 6942508281251 (MF)
	$c190$
106*	$2 \cdot 11 \cdot 127 \cdot 827$
	$c203$
107	3^3
	$p12$: 536288185369 (MF)
	$p199$
108*	$2^2 \cdot 3^3$
	$p18$: 128451681010379681 (AM)
	$c196$
109*	$7 \cdot 1559 \cdot 78176687$
	$p20$: 73024355266099724939 (AM)
	$c187$
110	$2 \cdot 3 \cdot 5 \cdot 4517$
	$p20$: 18443752916913621413 (AM)
	$p197$
111	$3 \cdot 293 \cdot 431 \cdot 230273 \cdot 209071 \cdot 241423723$
	$p10$: 3182306131 (MF)
	$p12$: 171974155987 (MF)
	$p13$: 1532064083461 (MF)
	$p17$: 59183601887848987 (MF)
	$p19$: 8526805649394145853 (AM)
	$p23$: 27151072184008709784271 (AM)
	$p109$
	continued...

n	Factors of Sm(n)
112	$2^3 \cdot 16619 \cdot 449797 \cdot 894009023$ $p17$: 74225338554790133 (MF) $p23$: 10021106769497255963093 (MF) $p169$
113*	$3 \cdot 11 \cdot 13 \cdot 5653 \cdot 1016453 \cdot 16784357$ $p18$: 116507891014281007 (AM) $p37$: 6844495453726387858061775603297883751 (AM) $c157$
114*	$2 \cdot 3 \cdot 7 \cdot 178333$ $c227$
115*	$5 \cdot 17 \cdot 19 \cdot 41 \cdot 36606 \cdot 71518987$ $p18$: 283858194594979819 (AM) $c202$
116*	$2^2 \cdot 3^2 \cdot 2239$ $c235$
117*	$3^2 \cdot 31883$ $p12$: 333699561211 (MF) $p20$: 28437086452217952631 (MF) $c206$
118*	$2 \cdot 83$ $p11$: 33352084523 (MF) $p20$: 20481677004050305811 (MF) $c214$
119*	$3 \cdot 59 \cdot 101 \cdot 139 \cdot 2801$ $c239$
120*	$2^4 \cdot 3 \cdot 5 \cdot 13 \cdot 16693063$ $c241$
121*	278240783 $c246$
122	$2 \cdot 3 \cdot 23 \cdot 618029123$ $p14$: 31949422933783 (MF) $p233$
123*	$3 \cdot 7 \cdot 37 \cdot 413923$ $p10$: 1565875469 (MF) $p16$: 5500432543504219 (MF) $c227$
124*	$2^2 \cdot 739393$ $p16$: 1958521545734977 (MF) $c242$
	continued...

n	Factors of Sm(n)
125*	$3^2 \cdot 5^3 \cdot 4019$ $p13$: 7715697265127 (MF) $c247$
126	$2 \cdot 3^2 \cdot 29 \cdot 103 \cdot 70271$ $p20$: 11513388742821485203 (MF) $p241$
127*	$53 \cdot 269 \cdot 4547$ $p20$: 56560310643009044407 (AM) $c245$
128*	$2^3 \cdot 3 \cdot 7 \cdot 11 \cdot 59 \cdot 215329$ $p22$: 8154316249498591416487 (MF) $c243$
129*	$3 \cdot 19$ $c277$
130*	$2 \cdot 5$ $p12$: 166817332889 (MF) $c269$
131*	$3 \cdot 19 \cdot 83 \cdot 1693$ $p11$: 23210501651 (MF) $p12$: 575587270441 (MF) $c256$
132*	$2^2 \cdot 3 \cdot 79$ $p13$: 2312656324607 (MF) $c272$
133*	$p19$: 8223519074965787731 (AM) $c272$
134*	$2 \cdot 3^3 \cdot 73 \cdot 6173$ $p16$: 5527048386371021 (AM) $p28$: 1417349652747970442615118133 (AM) $c243$
135*	$3^3 \cdot 5 \cdot 11 \cdot 37 \cdot 647$ $p10$: 1480867981 (MF) $p12$: 174496625453 (MF) $p15$: 151994480112757 (MF) $c255$
136*	$2^5 \cdot 1259 \cdot 4111$ $p13$: 9485286634381 (MF) $p26$: 10151962417972135624157641 (AM) $c253$

continued...

n	Factors of Sm(n)
137*	$3 \cdot 7^2$
	$p13$: 7459866979837 (MF)
	$c288$
138*	$2 \cdot 3 \cdot 181 \cdot 78311 \cdot 914569$
	$p15$: 413202386279227 (MF)
	$c277$
139*	13
	$p11$: 62814588973 (MF)
	$p12$: 115754581759 (MF)
	$p12$: 964458587927 (MF)
	$p22$: 9196988352200440482601 (MF)
	$c252$
140*	$2^2 \cdot 3 \cdot 5 \cdot 23 \cdot 761 \cdot 1873 \cdot 12841$
	$p11$: 34690415939 (MF)
	$p18$: 226556543956403897 (AM)
	$p23$: 10856300652094466205709 (AM)
	$c248$
141	$3 \cdot 107171$
	$p309$
142*	$2 \cdot 7 \cdot 4523 \cdot 14303 \cdot 76079$
	$p22$: 2244048237264532856611 (AM)
	$c282$
143*	$3^2 \cdot 859$
	$c317$
144	$2^3 \cdot 3^2 \cdot 6361$
	$p13$: 6585181700551 (MF)
	$p14$: 81557411089043 (MF)
	$p21$: 165684233831183308123 (MF)
	$p271$
145*	$5 \cdot 96151639$
	$c326$
146*	$2 \cdot 3 \cdot 13 \cdot 83$
	$p12$: 720716898227 (MF)
	$p19$: 1122016187632880261 (MF)
	$c296$
147*	$3 \cdot 59113$
	$p22$: 1833894252004152212837 (AM)
	$p31$: 1519080701040059055565669511153 (MF)
	$c276$
	continued...

n	Factors of Sm(n)
148*	$2^2 \cdot 197 \cdot 11927 \cdot 17377 \cdot 273131 \cdot 623321$ $p13$: 3417425341307 (AM) $p13$: 4614988413949 (MF) $c288$
149*	$3 \cdot 103 \cdot 131 \cdot 1399$ $c331$
150*	$2 \cdot 3 \cdot 5^2 \cdot 11 \cdot 23$ $p16$: 2315007810082921 (MF) $p26$: 92477662071402284092009799 (MF) $c296$
151*	$7 \cdot 53 \cdot 1801 \cdot 3323$ $c335$
152*	$2^4 \cdot 3^2 \cdot 131 \cdot 10613$ $p20$: 29354379044409991753 (AM) $p22$: 2587833772662908004979 (MF) $c298$
153*	$3^2 \cdot 29 \cdot 7237 \cdot 6987053 \cdot 8237263 \cdot 389365981$ $c322$
154*	$2 \cdot 17 \cdot 19 \cdot 43$ $p18$: 444802312089588077 (MF) $p21$: 855286987917657769927 (EW) $c311$
155	$3 \cdot 5 \cdot 66500999$ $p24$: 223237752082537677918401 (EW) $p323$
156*	$2^2 \cdot 3 \cdot 7 \cdot 3307$ $c354$
157*	$11 \cdot 53 \cdot 492601 \cdot 43169527$ $p12$: 645865664923 (MF) $p18$: 125176035875938771 (MF) $c318$
158*	$2 \cdot 3 \cdot 17 \cdot 29 \cdot 53854663$ $p21$: 164031369541076815133 (EW) $c334$
159*	$3 \cdot 71 \cdot 647$ $p10$: 3175105177 (AM) $p25$: 1957802969152764074566129 (EW) $c330$
160*	$2^3 \cdot 5 \cdot 37 \cdot 130547 \cdot 859933 \cdot 21274133$
	continued...

n	Factors of Sm(n)
	$p27$: 122800249349203273846720291 (EW)
	$c324$
161	$3^4 \cdot 59 \cdot 491 \cdot 81705851$
	$p360$
162*	$2 \cdot 3^5 \cdot 2999$
	$p21$: 393803780657062026421 (AM)
	$c351$
163*	2381
	$p11$: 72549525869 (AM)
	$p12$: 666733067809 (AM)
	$p25$: 1550529016982764630292633 (AM)
	$c330$
164*	$2^2 \cdot 3$
	$c383$
165*	$3 \cdot 5 \cdot 7 \cdot 13 \cdot 31 \cdot 247007767$
	$p15$: 490242053931613 (MF)
	$c359$
166	$2 \cdot 89$
	$p23$: 55566524959746113370037 (AM)
	$p365$
167*	$3 \cdot 3313$
	$c389$
168	$2^7 \cdot 3 \cdot 532709$
	$p387$
169*	$2671 \cdot 5233$
	$c392$
170*	$2 \cdot 3^2 \cdot 5 \cdot 7 \cdot 701$
	$p14$: 73406007054077 (MF)
	$c382$
171*	$3^2 \cdot 1237$
	$p19$: 6017588157881558471 (AM)
	$c382$
172*	$2^2 \cdot 11 \cdot 13 \cdot 37$
	$c403$
173*	$3 \cdot 17 \cdot 53 \cdot 101 \cdot 153 \cdot 11633 \cdot 228673$
	$c394$
174*	$2 \cdot 3 \cdot 59 \cdot 277 \cdot 2522957$
	$p22$: 2928995151034569627547 (AM)
	$c381$
	continued...

n	Factors of Sm(n)
175*	5^2
	$p13$: 2606426254567 (MF)
	$c403$
176*	$2^3 \cdot 3 \cdot 19 \cdot 1051$
	$p19$: 1031835687651103571 (AM)
	$c396$
177*	$3 \cdot 109 \cdot 153277 \cdot 6690569$
	$p11$: 32545700623 (MF)
	$p16$: 2984807754776597 (MF)
	$c382$
178	2
	$p13$: 3144036216187 (MF)
	$p17$: 11409535046513339 (MF)
	$p397$
179*	$3^2 \cdot 7 \cdot 11 \cdot 359$
	$c423$
180*	$2^2 \cdot 3^2 \cdot 5 \cdot 43 \cdot 89 \cdot 7121$
	$c422$
181*	$31 \cdot 197 \cdot 70999$
	$p20$: 46096011552749697739 (AM)
	$c406$
182*	$2 \cdot 3 \cdot 123529391$
	$c429$
183*	$3 \cdot 29 \cdot 661 \cdot 1723$
	$p16$: 3346484052265661 (AM)
	$c417$
184*	$2^4 \cdot 7 \cdot 59 \cdot 191 \cdot 1093 \cdot 1223$
	$p11$: 22521973429 (MF)
	$p17$: 15219125459582087 (MF)
	$p18$: 158906425126963139 (MF)
	$p19$: 2513521443592870099 (MF)
	$c369$
185*	$3 \cdot 5 \cdot 94050577$
	$p13$: 4716042857821 (MF)
	$p16$: 3479131875325867 (MF)
	$c409$
186*	$2 \cdot 3 \cdot 1201$
	$p21$: 574850252802945786301 (MF)
	$c425$
	continued...

n	Factors of Sm(n)
187*	$349 \cdot 506442073$
	$c442$
188*	$2^2 \cdot 3^3$
	$c454$
189*	$3^3 \cdot 47 \cdot 1515169$
	$p10 : 1550882611$ (MF)
	$p10 : 1687056803$ (MF)
	$p21 : 348528133548561476953$ (AM)
	$c410$
190	$2 \cdot 5 \cdot 379$
	$p23 : 46645758388308293907739$ (AM)
	$p435$
191*	$3 \cdot 13 \cdot 5233$
	$p12 : 164130096629$ (MF)
	$p20 : 13806214882775315521$ (MF)
	$c429$
192*	$2^3 \cdot 3 \cdot 29 \cdot 41$
	$c463$
193*	$7 \cdot 419$
	$c467$
194*	$2 \cdot 3 \cdot 11 \cdot 31 \cdot 491 \cdot 34188439$
	$p14 : 28739332991401$ (MF)
	$p16 : 8203347603076921$ (MF)
	$p19 : 1507421050431503839$ (MF)
	$p20 : 22805873052490568609$ (MF)
	$p21 : 168560953170124281211$ (MF)
	$c373$
195*	$3 \cdot 5 \cdot 397 \cdot 21728563 \cdot 300856949 \cdot 554551531$
	$p10 : 8174619091$ (MF)
	$c438$
196	$2^2 \cdot 17 \cdot 73 \cdot 79$
	$p10 : 3834513037$ (MF)
	$p465$
197*	$3^2 \cdot 37 \cdot 6277$
	$p16 : 1368971104990459$ (MF)
	$c461$
198*	$2 \cdot 3^2 \cdot 7^2 \cdot 13$
	$c482$
199*	151
	continued...

n	Factors of Sm(n)
200*	$c487$ $2^5 \cdot 3 \cdot 5^2$ $c488$

Table 2: Factorizations of Sm(n), $1 < n \leq 200$

4.2 Reverse Smarandache Factors

Contributors of Reverse Smarandache factors		
RB	Robert Backstrom	bobb@atinet.com.au
BD	Bruce Dodson	bad0@lehigh.edu
MF	Micha Fleuren	michaf@sci.kun.nl
AM	Allan MacLeod	MACL-MS0@wpmail.paisley.ac.uk
RS	Ralf Stephan	stephan@tmt.destephan@tmt.de
PZ	Paul Zimmermann	Paul.Zimmermann@loria.fr
	continued...	

Table 3: Contributors of Reverse Smarandache factors

n	Factors of Rsm(n)
2	3.7
3	3.107
4	29.149
5	3.19.953
6	3.218107
7	19.402859
8	3^2.1997.4877
9	$3^2.17^2$.379721
10	7.28843.54421
11	3 $p12$: 370329218107
12	3.7 $p13$: 5767189888301
13	17.3243967.237927839
14	3.11.24769177 $p10$: 1728836281
15	3.13.19^2.79
	continued...

n	Factors Rsm(n)
	$p15$: 136133374970881
16	23.233.2531
	$p16$: 1190788477118549
17	3^2.13.17929.25411.47543.677181889
18	$3^2.11^2$.19.23.281.397.8577529.399048049
19	17.19
	$p13$: 1462095938449
	$p14$: 40617114482123
20	3.89.317.37889
	$p21$: 629639170774346584751
21	3.37
	$p12$: 732962679433
	$p19$: 2605975408790409767
22	13.137.178489
	$p13$: 1068857874509
	$p14$: 65372140114441
23	3.7.191
	$p32$: 57896086242376368771207207952821 1
24	3.107.457.57527
	$p28$: 2871443437738722704707428655 9
25	11.31.59.158820811.410201377
	$p20$: 19258319708850480997
26	3^3.929.1753.2503.4049.11171
	$p24$: 527360168663641090261567
27	3^5.83
	$p10$: 3216341629
	$p13$: 7350476679347
	$p18$: 571747168838911343
28	23.193.3061
	$p19$: 2150553615963932561
	$p21$: 967536566438740710859
29	3.11.709.105971.2901761
	$p10$: 1004030749
	$p24$: 405373772791370720522747
30	3.73.79.18041.24019.32749
	$p10$: 5882899163
	$p24$: 209731482181889469325577
31	7.30331061
	$p45$: 147434568678270777660714676905519165947320523
	continued...

n	Factors Rsm(n)
32	3.17.1231.28409
	$p12$: 103168496413
	$p35$: 17560884933793586444909640307424273
33	3.7.7349
	$p10$: 9087576403
	$p42$: 237602044832357211422193379947758321446883
34	89.488401.2480227.63292783.254189857
	$p10$: 3397595519
	$p19$: 5826028611726606163
35	3^2.881.1559.755173.7558043
	$p10$: 1341824123
	$p16$: 4898857788363449
	$p16$: 7620732563980787
36	$3^2.11^2$.971
	$p13$: 1114060688051
	$p22$: 1110675649582997517457
	$p24$: 277844768201513190628337
37	29.2549993
	$p20$: 39692035358805460481
	$p38$: 12729390074866695790994160335919964253
38	3.9833
	$p63$
39	3.19.73.709.66877
	$p58$
40	11.41.199
	$p27$: 537093776870934671843838337
	$p39$: 837983319570695890931247363677891299117
41	3.29.41.89.3506939
	$p14$: 18697991901857
	$p20$: 59610008384758528597
	$p28$: 3336615596121104783654504257
42	3.13249.14159.25073
	$p10$: 6372186599
	$p52$
43	52433
	$p20$: 73638227044684393717
	$p53$
44	3^2.7.3067.114883.245653
	$p23$: 65711907088437660760939
	continued...

n	Factors Rsm(n)
	$p41$: 12400566709419342558189822382901899879241
45	3^2.23.167.15859.25578743
	$p65$
46	23.35801
	$p12$: 543124946137
	$p23$: 45223810713458070167393
	$p43$: 2296875006922250004364885782761014060363847
47	3.11.31.59
	$p16$: 1102254985918193
	$p28$: 4808421217563961987019820401
	$p38$: 14837375734178761287247720129329493021
48	3.151.457.990013
	$p15$: 246201595862687
	$p24$: 636339569791857481119613
	$p39$: 15096613901856713607801144951616772467
49	71
	$p10$: 9777943361
	$p77$
50	3.157.3307
	$p13$: 3267926640703
	$p30$: 771765128032466758284258631297
	$p43$: 1285388803256371775298530192200584446319323
51	3.11
	$p92$
52	7.29.670001
	$p12$: 403520574901
	$p14$: 70216544961751
	$p16$: 1033003489172581
	$p47$: 13191839603253798296021585972083396625125257997
53	3^4.499.673.6287.57653.199236731
	$p16$: 1200017544380023
	$p28$: 1101541941540576883505692003
	$p31$: 2061265130010645250941617446327
54	$3^3.7^4$.13.1427.632778317
	$p11$: 57307460723
	$p13$: 7103977527461
	$p15$: 617151073326209
	$p43$: 2852320009960390860973654975784742937560247
55	357274517.460033621
	continued...

n	Factors Rsm(n)
	p84
56	3.13^2
	p14 : 85221254605693
	p87
57	3.41
	p11 : 25251380689
	p93
58	11.2425477
	p15 : 178510299010259
	p18 : 377938364291219561
	p28 : 5465728965823437480371566249
	p40 : 5953809889369952598561290100301076499293
59*	3
	c109
60	3
	p10 : 8522287597
	p101
61	13.373
	p22 : 6399032721246153065183
	p42 : 214955646066967157613788969151925052620751 (RB)
	p46 : 9236498149999681623847165427334133265556780913
62	3^2.11.487.6870011
	p13 : 3921939670009
	p14 : 11729917979119
	p28 : 9383645385096969812494171823
	p50 : 43792191037915584824808714186111429193335785529359
63	3^2.97.26347
	p24 : 338856918508353449187667
	p86
64	397.653
	p12 : 459162927787
	p14 : 27937903937681
	p24 : 386877715040952336040363
	p65
65*	3.7.23.13219.24371
	c110
66	3.53.83.2857.1154129.9123787
	p103
67*	43
	continued...

n	Factors Rsm(n)
	$p11$: 38505359279
	$c113$
68	3.29.277213.68019179.152806439
	$p18$: 295650514394629363
	$p20$: 14246700953701310411
	$p67$
69	3.11.71.167.1481
	$p10$: 2326583863
	$p23$: 19962002424322006111361
	$p89$
70	1157237.41847137
	$p22$: 8904924382857569546497
	$p96$
71	3^2.17.131.16871
	$p10$: 1504047269
	$p11$: 82122861127
	$p19$: 1187275015543580261
	$p87$
72	3^2.449.1279
	$p129$
73	7.11.21352291
	$p10$: 1051174717
	$p17$: 92584510595404843
	$p20$: 33601392386546341921
	$p83$
74	3.177337
	$p10$: 6647068667
	$p11$: 31386093419
	$p15$: 669035576309897
	$p16$: 4313244765554839
	$p32$: 67415094145569534144512937880453 (PW)
	$p51$
75	3.7.230849.7341571.24260351
	$p10$: 1618133873
	$p14$: 19753258488427
	$p17$: 46752975870227777
	$p28$: 7784620088430169828319398031 (PW)
	$p53$
76*	53
	continued...

n	Factors Rsm(n)
	$c142$
77	3.919
	$p15$: 571664356244249
	$p22$: 6547011663195178496329 (PW)
	$p27$: 591901089382359628031506373 (BD)
	$p33$: 335808390273971395786635145251293 (PW)
	$p46$: 3791725400705852972336277620397793613760330637
78*	3.17.47
	$p14$: 17795025122047
	$c131$
79	160591
	$p15$: 274591434968167
	$p19$: 1050894390053076193
	$p112$
80*	3^3.11.443291.1575307
	$p17$: 19851071220406859
	$c121$
81	$3^3.23^2$.62273.22193.352409
	$p15$: 914359181934271 (MF)
	$p120$
82	*PRIME*! (RS)
83*	3
	$c157$
84*	3.11.47.83.447841.18360053
	$p14$: 53294058577163 (MF)
	$c130$
85	$p12$: 465619934881 (MF)
	$p22$: 5013354844603778080337 (AM)
	$p128$
86*	3.7.3761.205111.16080557.16505767
	$c139$
87	3.2423
	$p25$: 4433139632126658657934801 (AM)
	$p30$: 951802198132419645688492825211 (MF)
	$p107$
88*	73.8747
	$c162$
89*	3^2.19.7052207
	$c161$
	continued...

n	Factors Rsm(n)
90*	3^2.157.257.691
	$c140$
91*	11.29.163.3559.2297.22899893
	$p15$: 350542343218231 (MF)
	$p25$: 8365221234379371317434883 (MF)
	$c115$
92*	3.17.113.376589.3269443.6872137
	$c153$
93*	3.13.69317.14992267
	$c164$
94*	7.593.18307
	$p11$: 51079607083 (MF)
	$c161$
95*	3.11.13.53.157.623541439
	$c166$
96*	3.7.211.14563.2297
	$c172$
97*	1553
	$c182$
98	3^2.101.401.5741.375373
	$p173$
99*	3^2.109.41829209
	$p12$: 174489586693 (MF)
	$c168$
100*	13.6779
	$p11$: 48856332919 (MF)
	$p26$: 41858129936073024200781901 (MF)
	$c150$
101*	3
	$p11$: 16320902651 (MF)
	$p19$: 3845388775716560041 (MF)
	$p33$: 693173763848292948494434792706137 (AM)
	$c132$
102*	3.101.103.36749
	$p11$: 10189033219 (MF)
	$p20$: 23663501701518727831 (AM)
	$p26$: 52648894306108287380398039 (AM)
	$c133$
103*	19.29.103.3119.154009291
	continued...

n	Factors Rsm(n)
90*	3^2.157.257.691
	c140
91*	11.29.163.3559.2297.22899893
	p15 : 350542343218231 (MF)
	p25 : 8365221234379371317434883 (MF)
	c115
92*	3.17.113.376589.3269443.6872137
	c153
93*	3.13.69317.14992267
	c164
94*	7.593.18307
	p11 : 51079607083 (MF)
	c161
95*	3.11.13.53.157.623541439
	c166
96*	3.7.211.14563.2297
	c172
97*	1553
	c182
98	3^2.101.401.5741.375373
	p173
99*	3^2.109.41829209
	p12 : 174489586693 (MF)
	c168
100*	13.6779
	p11 : 48856332919 (MF)
	p26 : 41858129936073024200781901 (MF)
	c150
101*	3
	p11 : 16320902651 (MF)
	p19 : 3845388775716560041 (MF)
	p33 : 693173763848292948494434792706137 (AM)
	c132
102*	3.101.103.36749
	p11 : 10189033219 (MF)
	p20 : 23663501701518727831 (AM)
	p26 : 52648894306108287380398039 (AM)
	c133
103*	19.29.103.3119.154009291
	continued...

n	Factors Rsm(n)
	$p12$: 329279243129 (MF)
	$p13$: 1240336674347 (MF)
	$c161$
104*	3.7.60953.1890719
	$p11$: 10446899741 (MF)
	$p15$: 216816630080837 (MF)
	$p19$: 1614245774588631629 (MF)
	$c149$
105*	3.7.859.6047.63601
	$c194$
106*	$p22$: 1912037972972539041647 (AM)
	$p22$: 3052818746214722908609 (AM)
	$c167$
107*	3^3.13.4519.114967
	$p10$: 1425213859 (MF)
	$p14$: 17641437858251 (MF)
	$c179$
108	3^3.23.457.1373
	$p12$: 605434593221 (MF)
	$p12$: 703136513561 (MF)
	$p183$
109	11.29.31^2.1709.30345569
	$p14$: 42304411918757 (MF)
	$p189$
110*	3.11.19.53.229.24672421
	$p24$: 611592384837948878235019 (AM)
	$c183$
111*	3.61.269.470077.143063.544035253
	$c200$
112*	137
	$p12$: 262756224547 (MF)
	$c214$
113*	3.19.45061.111211
	$c219$
114*	3.19.53.59
	$c228$
115*	137.509.1720003
	$c226$
116	3^2.83.103.156307.176089.21769127
	continued...

n	Factors Rsm(n)
	$p217$
117	3^2
	$p242$
118	7.4603
	$p241$
119*	3.7
	$c247$
120*	3.73
	$c249$
121*	31.371177
	$c248$
122*	3.17
	$p11$: 91673873887 (MF)
	$c245$
123	3.1197997
	$p11$: 15744706711 (MF)
	$p244$
124*	37.1223
	$c259$
125	3^2.59.83
	$p10$: 5961006911 (MF)
	$p13$: 1096598255677 (MF)
	$p240$
126*	3^2.13.68879.135342173
	$c255$
127*	97
	$p16$: 1385409249340483 (AM)
	$c255$
128*	3.34613.29497667
	$c263$
129*	3.23.1213.82507
	$p12$: 420130412231 (MF)
	$c257$
130*	31.263.86969.642520369
	$c264$
131*	3.11.4111.852143
	$p12$: 606617222863 (MF)
	$p23$: 33247682213571703426139 (AM)
	$c239$
	continued...

n	Factors Rsm(n)
132	3.7.11.41.43.31259.69317.180307.199313
	$p17$: 16995472858509251 (MF)
	$p20$: 56602777258539682957 (AM)
	$p226$
133	7.13
	$p20$: 22533511116338912411 (AM)
	$p269$
134*	3^3.37.29004967
	$p17$: 60164048964096599 (AM)
	$c266$
135*	3^3.211.5393.98563
	$p12$: 207481965329 (MF)
	$p22$: 6789282931372049267693 (AM)
	$c251$
136*	
137*	3.179
	$p22$: 6796599525965619205571 (AM)
	$c278$
138*	3.119611.314087617
	$c292$
139*	
140*	3.317.772477
	$p15$: 153629260660723 (AM)
	$c289$
141*	3.631.65831
	$c307$
142*	859.2377.2909.6521
	$p14$: 41190901651547 (MF)
	$c291$
143	3^2.93971
	$p12$: 9053448211979 (MF)
	$p302$
144*	3^2
	$p19$: 5028055908018884749 (MF)
	$c304$
145*	57719.2691841
	$p20$: 45690580335973653419 (MF)
	$c296$
146*	3.7^2.277.19319.55807
	continued...

n	Factors Rsm(n)
	$p13$: 2454423915989 (MF)
	$c304$
147*	$3.7^2.19.31.15467623$
	$c321$
148*	$p20$: 33825333713396366003 (AM)
	$p23$: 25082957895838310384953 (AM)
	$c294$
149*	3.109.34442413
	$c329$
150*	3.59.257
	$c337$
151*	$p10$: 7134941903 (MF)
	$c335$
152	$3^2.13$
	$p21$: 412891312089439668533 (MF)
	$p325$
153*	$3^2.67793$
	$p18$: 237333508084627139 (MF)
	$c328$
154*	11.53861
	$p10$: 1118399729 (MF)
	$c339$
155*	3.41.33842293
	$c347$
156*	3.21961
	$c355$
157*	$p10$: 4136915059 (MF)
	$c353$
158*	3.31.89209
	$p10$: 1379633699 (MF)
	$p14$: 54957888020501 (MF)
	$c336$
159*	3.13.5669.11213.816229087
	$p10$: 50611041883 (MF)
	$c340$
160*	7.942037.1223207
	$p21$: 125729584994875519171 (AM)
	$c339$
161*	$3^7.7.37.67.6521.826811.6018499$
	continued...

n	Factors Rsm(n)
	$p23$: 7755890044426607525680l (MF)
	$c328$
162*	3^4.1295113.202557967
	$c361$
163*	$p16$: 1139924663537993 (MF)
	$p17$: 17672171439068059 (MF)
	$c350$
164	3.193
	$p24$: 105444241520715055381519 (AM)
	$p358$
165*	3
	$c386$
166*	$p15$: 396444477663149 (MF)
	$p32$: 15221332593310506150048824812249 (AM)
	$c344$
167*	3.17.373.7346281.8927551.194571659
	$p20$: 68277637362521294401 (AM)
	$c347$
168*	3.59.35537.68102449
	$p19$: 7766035514845504007 (AM)
	$c362$
169*	
170	3^2.23.
	$p16$: 3737994294192383 (MF)
	$p384$
171*	3^2.37
	$p12$: 237089136881 (MF)
	$p19$: 2153684224509566597 (MF)
	$p21$: 175530075465216996787 (MF)
	$p22$: 8105319358780665120301 (MF)
	$c330$
172	17.29.281
	$p10$: 4631571401 (MF)
	$p11$: 31981073881 (MF)
	$p15$: 119749047957053 (MF)
	$p368$
173*	3.1787
	$c407$
174*	3.7.269.397.156894809
	continued...

n	Factors Rsm(n)
	$c399$
175*	7.11
	$p10$: 3763462823 (MF)
	$c405$
176*	3.11.47.49613
	$p13$: 2800890701267 (MF)
	$p15$: 315698062297249 (MF)
	$p27$: 880613122533775176075766757 (MF)
	$c358$
177	3.73.1753
	$p14$: 29988562180903 (MF)
	$p404$
178	13.47.353.644951.487703.1436731
	$p12$: 728961984851 (MF)
	$p14$: 34686545199997 (MF)
	$p14$: 36329334000803 (MF)
	$p364$
179*	3^2.23.43
	$p14$: 50981967790529 (MF)
	$c411$
180*	3^2.29
	$p17$: 33644294710009721 (MF)
	$c413$
181*	325251083
	$p17$: 57421731284347247 (MF)
	$c410$
182*	3.107.5568133
	$p12$: 139065644033 (MF)
	$c417$
183*	3.23.89
	$c437$
184*	23.19531
	$p15$: 196140464783429 (MF)
	$c424$
185*	3.13.919
	$p11$: 32173266383 (MF)
	$c432$
186*	3.23
	$c448$
	continued...

n	Factors Rsm(n)
187*	61.83.103.523.3187
	$p19$: 1018598504636281577 (MF)
	$c423$
188*	3^3.7.7681.65141
	$c445$
189*	3^3.7.2039.3823.9739.212453.10586519
	$c433$
190*	83.107.1871.25346653
	$c447$
191	3.809
	$p18$: 627089953107590081 (MF)
	$p444$
192*	3.2549
	$c464$
193*	47.503.12049
	$c463$
194*	3.179
	$p22$: 8000103240831609636731 (AM)
	$p23$: 77947886830169946060329 (MF)
	$c426$
195*	3.79.8219
	$c471$
196*	19
	$p16$: 8982588119304797 (AM)
	$c463$
197*	3^2.11.43.11743.125201.867619
	$p11$: 61951529111 (MF)
	$p14$: 27090970290157 (MF)
	$c440$
198	3^2.11.37.2837
	$p19$: 1245013373736039779 (MF)
	$p461$
199*	103.2377
	$c484$
200*	3.1666421
	$c485$

Table 4: Factorizations of Rsm(n), $1 < n \leq 200$

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The very latest up to date representation of this list can be found at the next URL: `http://www.sci.kun.nl/sigma/Persoonlijk/michaf/ecm/`.

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