Dozenal Home Primes

Jay L. Schiffman ⚘ Rowan University

Introduction

The Home Prime Conjecture represents a very neat problem encompassing the interface of mathematics and technology. This problem first sparked a great deal of interest in 11X5; (**1997.**) with a feature article in *The Journal of Recreational Mathematics* by Jeffrey Heleen entitled "Family Numbers: Constructing Primes by Prime Factor Splitting." The iterative process is quite simple. Consider any composite integer and resolve this integer into its prime factorization. Concatenate the factors in order of increasing magnitude and factor the new integer that is formed. Repeat the process. The HOME PRIME CONJECTURE asserts that eventually a prime number will be obtained which is the *Home Prime* (HP) of the original composite integer. To cite an example, consider the decimal integer **10**. The repeated factorizations and concatenations result in the eventual prime **773**, which is the Home Prime of **10**. The steps are furnished below:

10 = (**2**)(**5**) → **25**
= (**5**)(**5**) → **55**
= (**5**)(**11**) → **511**
= (**7**)(**73**) → **773**, a PRIME
and so HP[**10**] = **773** in **4** steps.

More compactly, one may write

HP[**10**] → (**2**)(**5**) → (**5**)(**5**) → (**5**)(**11**) → (**7**)(**73**) → PRIME **773** (**4**)

in base dek where the last (4) indicates the number of steps needed for **10** to reach its Home Prime. Note that Home Primes are base-dependent in the sense that families of integers in the repeated factoring and concatenation process in one number base are generally not in the same family in a different number base. For example, in base ten, HP(**10**) = **773** while in dozenal, HP(X;) = 25;. Similarly decimally, HP(**12**) = **223** while in dozenal, HP(10;) = 3357;. Here decimal numerals are in **bold face** to distinguish them from their duodecimal counterparts.

While many composite integers have their Home Primes generated in a few steps, the Home Prime for the decimal integer **49** (and subsequently the integers **77** and **711** which belong to the same family in the repeated concatenation process) remains unresolved after more than one hundred steps. This is due to the inability for even the most sophisticated technology to factor very large integers which is an NP hard problem. (For information on the complexity of algorithms which encompasses algorithmic procedures that can be performed in polynomial time versus those that are intractable, the reader is referred to the on-line mathematics encyclopedia Mathworld as reference 2 in the appended bibliography. Proceed in the alphabetical index to NP Problems.) The factoring algorithm is contingent upon the second largest prime factor when factoring a composite integer. If this second largest prime factor has many digits, the search may become stalled at that stage of the process. In my paper, I extend this classic Home Prime problem to the duodecimal base using the Mathematica Program to generate the Home Primes for every one of the 91; composite integers save 26; and 6Ӿ; among the first gross of integers. Unfortunately the Home Primes for 26; and 6Ӿ; are stalled in trying to respectively factor an 85; digit duodecimal and **109** digit decimal composite integer after 55; iterations. I am currently using Mathematica to potentially secure the common Home Prime for these two composite integers and this is a work in progress. In addition, a rechecking of my work for 54; and 68; indicates that the Home Primes have yet to be found for these composite integers as well. After 49; iterations for the integer 54; we are led to a 83; digit composite duodecimal integer (**107** Digits decimally) such that factoring is extremely difficult. Similarly, after 57; iterations for the integer 68;, we encounter a 79; digit composite duodecimal integer (**100** digits decimally) for which factoring is seemingly intractable. These "forbidden four" represent the only integers for which I have yet to secure the Home Prime. This is in contrast to the decimal base where the integers **49** and **77** in the range **1–100** are such that the Home Prime Conjecture remains unresolved.

Our initial goal is to secure the Home Prime for a duodecimal integer. Let us consider the integer 20;. Our repeated factorings and concatenations are as follows:

hp[20] → (2)(2)(2)(3) → (3)(3)(2Ӿ Ɛ) → (17)(37)(6Ɛ) → (61)(320Ɛ) → (107)(59Ӿ5)
→ Prime 1 075 9Ӿ5 (5)

Hence 10759Ӿ5 is the Home Prime of 20 achieved in five steps.

Let us contrast this with the Home Prime for the integer **24** in base ten. The iterations are displayed below:

hp[**24**] → (**2**)(**2**)(**2**)(**3**) → (**3**)(**3**)(**13**)(**19**) → Prime **331319** (**2**)

Note decimally that **331319** (i.e. 13Ɛ89Ɛ;) is the Home Prime of **24** obtained in two steps.

It should similarly be noted that the numeral 6Ӿ; in base duo has a seemingly intractable composite integer to factor with regards to securing its Home Prime during step 59; in base twelve. In contrast, the Home Prime is reached in one step when taken as a decimal numeral:

hp[**82**] → (**2**)(**41**) → Prime **241** (**1**)

In a like manner, when 49 in base ten is taken as the duodecimal numeral 41; the repeated concatenation in securing the Home Prime is delightfully easy. We illustrate the steps below:

hp[41] → (7)(7) → (7)(11) → Prime 711 (2)

Thus 711; is the Home Prime of 41; achieved in just two steps.

We next demonstrate all the Home Primes for the composite integers no greater than one gross with the exceptions of 54;, 68; and 26; and 6Ӿ; which belong to the same family. For the latter integers, the iterations including the step where the process is stalled is duly noted. All integers are duodecimal unless otherwise indicated. At times, a large factor continues to a second line. In such a case, we read the entire integer in parentheses as a factor. For example, in the concatenations related to the integer 26; the last factor in iteration 51; which is

→ (5)(216536040Ɛ)(7Ɛ80290Ӿ182750Ɛ223Ɛ532Ӿ41Ӿ7Ɛ1Ɛ30Ӿ276712946ӾӾ738Ӿ7414036-
1760560618924297064Ɛ180324775)

reads:

7Ɛ80290Ӿ182750Ɛ223Ɛ532Ӿ41Ӿ7Ɛ1Ɛ30Ӿ276712946ӾӾ738Ӿ741403617605606189242970 64Ɛ180324775.

Continued on page 15;

Dozenal Home Primes for Integers up to One Gross

Int	Ct	Home Prime
1	—	—
2	0	2
3	0	3
4	3	737
5	0	5
6	Ɛ	18Ɛ194713227Ɛ
7	0	7
8	2	2111
9	3	575
χ	1	25
Ɛ	0	Ɛ
10	2	3357
11	0	11
12	1	27
13	1	35
14	14	*See Extended Table Below*
15	0	15
16	2	391
17	0	17
18	1	225
19	1	37
1χ	2	57
1Ɛ	0	1Ɛ
20	5	10759χ5
21	2	511
22	2	737
23	χ	18Ɛ194713227Ɛ
24	2	Ɛ25
25	0	25
26	*	*In Progress*
27	0	27
28	4	7655143Ɛ
29	1	3Ɛ
2χ	4	5237
2Ɛ	1	57
30	3	251345

Int	Ct	Home Prime
31	0	31
32	1	217
33	2	575
34	9	8Ɛ57733χ7Ɛ;
35	0	35
36	1	237
37	0	37
38	2	1517
39	2	Ɛ37
3χ	1	21Ɛ
3Ɛ	0	3Ɛ
40	2	33Ɛ321
41	2	711
42	1	255
43	1	315
44	4	22177Ɛ
45	0	45
46	24	*See Extended Table Below*
47	1	5Ɛ
48	6	313Ɛ8χƐ5
49	4	χƐ5ƐƐ
4χ	1	225
4Ɛ	0	4Ɛ
50	2	5531
51	0	51
52	2	Ɛ25
53	4	517χ7
54	*	*In Progress*
55	1	511
56	1	557
57	0	57
58	1	2215
59	2	5711
5χ	7	1775591
5Ɛ	0	5Ɛ
60	2	3572ƐƐ

Extended Table

Int	Ct	Home Prime
14	14	1Ɛ59χ6773607573390475 35Ɛ15081Ɛ
46	24	3Ɛ175313542χ547491319184 77Ɛ0893050181

Dozenal Home Primes for Integers up to One Gross

Int	Ct	Home Prime	Int	Ct	Home Prime
61	0	61	91	0	91
62	6	553533	92	1	25Ɛ
63	Ɛ	1254571591	93	3	5537
64	2	455Ɛ	94	1	22227
65	2	517	95	0	95
66	8	181Ɛ681591	96	1	2317
67	0	67	97	1	51Ɛ
68	*	*—In Progress—*	98	9	8Ɛ57733χ7Ɛ
69	3	435971	99	7	916928Ɛ
6χ	*	*—In Progress—*	9χ	1	24Ɛ
6Ɛ	0	6Ɛ	9Ɛ	10	51Ɛ5Ɛ312349295
70	2	7391	χ0	11	229714587Ɛ0χ584Ɛ
71	3	11χ7	χ1	2	Ɛ11
72	1	237	χ2	1	251
73	1	325	χ3	2	Ɛ37
74	1	222Ɛ	χ4	6	313Ɛ8χƐ5
75	0	75	χ5	4	53χ2Ɛ
76	1	2335	χ6	1	2337
77	1	711	χ7	0	χ7
78	1	221Ɛ	χ8	2	246Ɛ2χ3Ɛ
79	1	327	χ9	4	517χ7
7χ	2	557	χχ	5	672ƐƐ
7Ɛ	1	517	χƐ	0	χƐ
80	10	118135891408816007	Ɛ0	2	15167
81	0	81	Ɛ1	2	1167
82	1	277	Ɛ2	7	1775591
83	1	33Ɛ	Ɛ3	1	3335
84	3	71χ6Ɛ	Ɛ4	1	22215
85	0	85	Ɛ5	0	Ɛ5
86	3	5255Ɛ	Ɛ6	1	231Ɛ
87	0	87	Ɛ7	0	Ɛ7
88	3	77797	Ɛ8	2	3187
89	1	357	Ɛ9	1	33Ɛ
8χ	17	11Ɛ422925562χ983χ5027	Ɛχ	1	25Ɛ
8Ɛ	0	8Ɛ	ƐƐ	1	Ɛ11
90	4	57χ1097	100	8	1712221596815

This table lists each duodecimal integer "Int" in red, up to one gross, the Count ("Ct", number of steps) in the second column needed to achieve its corresponding Home Prime in the third column. Note that any prime requires zero steps to reach the Home Prime, namely itself. Visit http://www.Dozenal.org/adjunct/db4b211.pdf to review any new iterations in the process for each of these integers. This document will be updated with regards to 26;, 54;, 68;, and 6χ; if and when we obtain more fruitful results, allowing interested readers to peruse them at leisure.

It is of interest to note that the mapping of a duodecimal integer into its Home Prime is not one-to-one in the sense that different duodecimal integers can possess identical Home Primes and hence belong to the same family. The following is a list of duodecimal integers less than one gross that have the same Home Prime:

4 and 22 → HP = 737	21 and 55 → HP = 511
6 and 23 → HP = 18Ɛ194713227Ɛ	41 and 77 → HP = 711
9 and 33 → HP = 575	5X and Ɛ2 → HP = 11775591
1X and 2Ɛ → HP = 57	65 and 7Ɛ → HP = 517

X1 and ƐƐ → HP = Ɛ11

Pseudocode

We next furnish an illustration of pseudocode to furnish the Home Prime of a composite integer as well as discuss the role a CAS (Computer Algebra System) program such as MATHEMATICA handles the task. The CAS program MATHEMATICA, a copyright of Wolfram Research, Inc. enabled me to conduct my searches. In the program, the commands **`IntegerDigits[]`** (to convert a decimal numeral to another base) and **`FromDigits[]`**(to covert a numeral in a different base to base ten) are utilized as well as **`FactorInteger[]`** to resolve an integer into its standard prime factored form. A sample problem follows below in which we secure the Home Prime in Base Twelve for the duodecimal integer X3 (**123**). We note that since the computer does not perform duodecimal arithmetic, it necessitates one to keep moving back and forth between duodecimals and decimals. The following is an example of pseudocode to secure the Home Prime of X3:

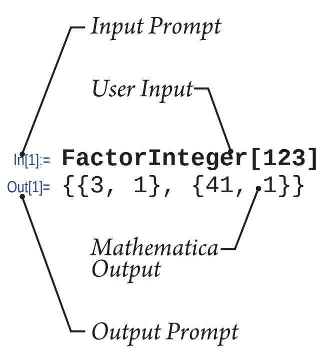
STEP 1: Express X3 in decimal	→ **123**
STEP 2: Factor **123**	→ **(3)(41)**
STEP 3: Express the factors in duodecimal	→ (3)(35)
STEP 4: Express 335 in decimal	→ **473**
STEP 5: Factor **473**	→ **(11)(43)**
STEP 6: Express the factors in duodecimal	→ (Ɛ)(37)
STEP 7: Express Ɛ37 in decimal	→ **1627**
STEP 8: Factor **1627**	→ **1627** IS PRIME

Therefore, HP(X3) = Ɛ37

In MATHEMATICA, the code is as follows:

```
In[1]:= FactorInteger[123]
Out[1]= {{3, 1}, {41, 1}}

In[2]:= IntegerDigits[{3, 41}, 12]
Out[2]= {{3}, {3, 5}}

In[3]:= FromDigits[{3, 3, 5}, 12]
Out[3]= 473

In[4]:= FactorInteger[473]
Out[4]= {{11, 1}, {43, 1}}

In[5]:= IntegerDigits[{11, 43}, 12]
Out[5]= {{11}, {3, 7}}

In[6]:= FromDigits[{11, 3, 7}, 12]
Out[6]= 1627

In[7]:= FactorInteger[1627]
Out[7]= {{1627, 1}}
```

MATHEMATICA Code Legend



Mathworld, a Wolfram Resource managed by Dr. Eric Weisstein of Wolfram Research, Inc. is an excellent source for everything mathematical and scientific, including a paragraph on our society found under the letter "D" obtainable in the alphabetical index on their website, www.mathworld.wolfram.com. Under the letter "H" is Home Prime which accesses a neat article devoted to this mathematical recreation. Contributors to Mathworld are Dr. Eric Weisstein as well as numerous mathematicians throughout the world. While Home Primes in bases up to ten have been investigated, there is nothing dealing with bases higher than ten which led me to initiate my research. I would be grateful if anyone can eventually factor the large composite integer that has stalled my search in securing the common duodecimal Home Prime for the duodecimal integers 26; and 6Ϫ; as they both belong to the same family.

References:

1. Heleen, Jeffrey, "Family Numbers: Constructing Primes by Prime Factor Splitting", *The Journal of Recreational Mathematics*, 24; (**28.**), p. 98;-9Ɛ; (p. **116.–119.**), 11Ϫ4–Ϫ5; (**1996–97.**)
2. Mathworld—A Wolfram Resource, Wolfram Research, Inc., Champaign, il. 11Ɛ6; (**2010.**)
3. "Home Prime", retrievable in November 11Ɛ6; (**2010.**) at http://mathworld.wolfram.com/HomePrime.html
4. "Duodecimal", retrievable in November 11Ɛ6; (**2010.**) at http://mathworld.wolfram.com/Duodecimal.html

Iterations of The Home Primes for all composite integers through 100; (144.):

4 → (2)(2) → (2)(11) → (7)(37) → PRIME 737 (3).

6 → (2)(3) → (3)(3)(3) → (3)(111) → (7)(7)(91) → (61)(131) → (5)(5)(27)(117) → (1Ɛ)(91)(38Ɛ5) → (431)(56Ɛ85) → (7)(7)(7)(15)(3Ɛ)(3Ϫ5) → (3Ɛ)(1Ɛ4762657) → (18Ɛ)(1947)(13227Ɛ) → PRIME 18Ɛ194713227Ɛ (Ɛ).

8 → (2)(2)(2) → (2)(111) → PRIME 2111 (2).

9 → (3)(3) → (3)(11) → (5)(75) → PRIME 575 (3).

Ϫ → (2)(5) → PRIME 25 (1).

10 → (2)(2)(3) → (3)(3)(5)(7) → PRIME 3357 (2).

12 → (2)(7) → PRIME 27 (1).

13 → (3)(5) → PRIME 35 (1).

14 → (2)(2)(2)(2) → (2)(5)(11)(25) → (5)(15)(3Ɛ)(107) → (Ɛ)(37)(241)(7ƐƐ) → (5)(231532897) → (1Ɛ)(111)(2596375) → (117)(225)(437)(21Ϫ51) → (5)(2877833152935) → (7)(8Ɛ6299054213Ɛ) → (5)(11)(17)(41ϪƐ)(2733379Ɛ) → (2047Ϫ41)(2608Ϫ04ϪϪ1Ɛ) → (7)(7)(7)(25)(1521)(9775)(382Ɛ345) → (7)(51)(251)(108Ɛ49586ƐϪ3718Ɛ) → (11)(12Ɛ)(4085)(14377578Ɛ4729275) → (5)(5)(1Ɛ)(27)(2897)(166Ɛ2ƐϪ85)(37290391Ɛ) → (1Ɛ5)(9Ϫ677)(360757)(3390475)(35Ɛ15081Ɛ) → PRIME 1Ɛ59Ϫ67736075733904753 5Ɛ15081Ɛ (14).

16 → (2)(3)(3) → (3)(91) → PRIME 391 (2).

18 → (2)(2)(5) → PRIME 225 (1).

19 → (3)(7) → PRIME 37 (1).

1χ → (2)(Ɛ) → (5)(7) → PRIME 57 (2).

20 → (2)(2)(2)(3) → (3)(3)(2χƐ) → (17)(37)(6Ɛ) → (61)(320Ɛ) → (107)(59χ5)
→ PRIME 10759χ5 (5).

21 → (5)(5) → (5)(11) → PRIME 511 (2).

22 → (2)(11) → (7)(37) → PRIME 737 (2).

23 → (3)(3)(3) → (3)(111) → (7)(7)(91) → (61)(131) → (5)(5)(27)(117)
→ (1Ɛ)(91)(38Ɛ5) → (431)(56Ɛ85) → (7)(7)(7)(15)(3Ɛ)(3χ5)
→ (3Ɛ)(1Ɛ4762657) → (18Ɛ)(1947)(13227Ɛ) → PRIME 18Ɛ194713227Ɛ (χ).

24 → (2)(2)(7) → (Ɛ)(25) → PRIME Ɛ25 (2).

26 → (2)(3)(5) → (7)(3Ɛ) → (5)(157) → (45)(11Ɛ) → (Ɛ)(17)(307) → (61)(19Ɛ67)
→ (457)(14471) → (5)(Ɛ)(Ɛ83957) → (195)(343Ɛ2Ɛ) → (7)(15)(21Ɛ3Ɛ71)
→ (7)(15)(905)(Ɛ5387) → (215Ɛ)(342χ0995) → (1Ɛ)(4Ɛ)(4401)(75χ85)
→ (35)(67)(105χ745897) → (Ɛ)(393Ɛ006504χ75) → (1χ7)(60192638χ35Ɛ)
→ (6995)(33χ05453Ɛ07) → (4Ɛ427)(146524Ɛ6Ɛχ1)
→ (5)(χ9Ɛ5)(11925)(Ɛ570355) → (23147Ɛ)(27418χ0Ɛ6927)
→ (739Ɛ5)(Ɛχ07Ɛ)(390962χ1) → (5)(11)(4Ɛ)(2337)(228045)(79Ɛ225)
→ (125)(32765)(139790691386085) → (7)(11)(11)(255)(7477)(11Ɛ8χ774Ɛ16281)
→ (1796Ɛ)(χ11χ1)(513747Ɛ72687Ɛ266Ɛ) → (8Ɛ64071)(2261ƐƐ791Ɛ0369706 51Ɛ)
→ (4Ɛ)(95)(1249796 3Ɛ7)(1Ɛ2838 3648Ɛ957Ɛ)
→ (7)(85)(102159165686 2χ5551452779831)
→ (5)(4071)(146Ɛ5)(5Ɛ4ƐƐ)(67Ɛ4650626343390Ɛ)
→ (17)(33Ɛ)(12χ1)(173297)(78χ2171)(95Ɛ782χ311481)
→ (5)(13Ɛ)(35Ɛ)(6Ɛ354327)(153219311χ31030156934Ɛ)
→ (5)(5)(15)(Ɛ5)(ƐƐ4894137Ɛ27671Ɛ)(19Ɛ250Ɛ3589518551)
→ (6Ɛ)(65977)(3271Ɛ2Ɛ01)(550258Ɛ87χ930150432427χ5)
→ (5)(141)(735)(18650χ4χ509106Ɛ8884872285691 3839χ15)
→ (17)(9Ɛ3Ɛ)(31Ɛ251)(2χƐ06791)(50Ɛχ9423148χ9989Ɛ6714151)
→ (325)(511)(3χχ6599671 76Ɛχ21)(38χ2898308495χƐ509652χ5)
→ (27)(617)(3χ2Ɛ)(14893Ɛ)(20317Ɛχ3557Ɛ6Ɛ)(282162687554Ɛ900387)
→ (7)(81)(6823χ25057208064 4χ05597χ8881482χ3071988χ2Ɛ501)
→ (3479Ɛ2Ɛ09052Ɛ)(232417Ɛ39330033χ177396664χ97Ɛ309Ɛ48Ɛ)
→ (5)(5)(51)(202869Ɛ)(1χ99764Ɛ51256Ɛ1299χ35χ8201854527489Ɛχ761)
→ (507)(214Ɛ5)(1590282717)(417812Ɛ0χ02Ɛ0852χ229186χ49960588χ25)
→ (66Ɛ18854910554525)(92682694839χ31490082873Ɛχ8306Ɛ72χ101)
→ (81)(13Ɛ)(7Ɛ711)(3039114χƐ54Ɛ063514χ55Ɛ)(37Ɛ86Ɛ274χ2χ0χ44493ƐƐ11)
→ (45389Ɛ)(19χ383ƐƐ603Ɛ13247χ001767Ɛ8997343951χ805374χ7Ɛχ120Ɛ)
→ (5)(45)(1245)(1947)(18265094877)(808Ɛ0Ɛ142540715346448 9Ɛ2Ɛ864331259957)
→ (3Ɛ)(228Ɛ45)(29Ɛ8χ15ƐƐƐ5)(χχχ764557447)(858Ɛ5416224χ5)(4085088241χχƐ1χ17)
→ (11)(31)(4Ɛ)(557)(721)(1χ23Ɛ)(351χ8ƐƐ90623Ɛ188741)
(17Ɛ6814844226χ09χ1χƐ502397071)
→ (15)(29684643Ɛ)(1934956871)(18545357χ74130χ018Ɛ7)
(113588Ɛ809Ɛ53χ1778389956591)
→ (11)(2Ɛ67)(9616840617697)(204921441437385 0χ1485χ035)
(33Ɛχ5ƐƐχƐ69χ743571χχ6χ75χ5)
→ (427)(1921)(Ɛ78877)(308Ɛ3241)(1χƐ95156Ɛ1371677)
(390χ2454χ93525593χ19Ɛ2671χ0χ5509Ɛ6Ɛ)
→ (113512051)
(3984χ1Ɛχ014518Ɛ8Ɛ2587374118639 5203Ɛ50χ791534980χ112180553801ƐƐƐƐ)
→ (5)(177χ9χ9χ28070901)(242Ɛ6513459202439Ɛχ037)
(83280598χ6χ95245Ɛ57603742341785χ461)
→ (7)(1Ɛ)(771)(χ45)(4χ91)

(1872899089Ɛ11X95XƐƐƐ72390189580Ɛ8522530723ƐƐ14X0384Ɛ1Ɛ55802Ɛ0Ɛ1)
→ (1X617427)(19X0477Ɛ5X050541791)
(21226Ɛ12X739941XX9701976X2105995349767 02Ɛ27194X6387)
→ (51)(1Ɛ7)(531)(617)(59Ɛ6Ɛ)(Ɛ18Ɛ85545)
(1X3803011481118446360124444687 3X04056Ɛ328X24265078X6621)
→ (5Ɛ)(8Ɛ)(12Ɛ)(1Ɛ0Ɛ1)(Ɛ4061360X4Ɛ18162Ɛ67)
(61Ɛ0X95718Ɛ4436Ɛ885375029Ɛ48025576X95X09Ɛ2709001365)
→ (7)(1011)(8235)(734887)(709781X7)(46Ɛ13053650ƐƐƐX61)
(913Ɛ153407X260129393Ɛ782771321027401198873 67)
→ (497)(68Ɛ5XXX345553336767 68XX4Ɛ9X515817)
(276152ƐXX03275211X1XX60690130ƐX922023543622XƐ5947)
→ (17)(111)(16Ɛ)(3Ɛ7)(5Ɛ91)(7841)(1328590Ɛ)(X4X733727560X593420765)
(13233138213Ɛ97571Ɛ20X479ƐƐ37868X082682 84Ɛ)
→ (45)(603601756X5)(42ƐƐ216Ɛ347Ɛ136765997)
(2039185847 93Ɛ4890504877Ɛ4116423Ɛ92180337610X634717944 22Ɛ5)
→ (1Ɛ)(131)(X35)(8XƐ19X41028X38Ɛ5Ɛ)
(2XX8X47234Ɛ85Ɛ615X94Ɛ4579162578 7554X1781072531Ɛ1XX412176Ɛ8781X986X91)
→ (709Ɛ347)(21196575)(1X9ƐƐ085000050Ɛ8Ɛ6191)
(9X040X763675Ɛ871048576005964634155ƐX15X55284732Ɛ441Ɛ2172ƐƐ)
→ (5)(216536040Ɛ)(7Ɛ80290X182750Ɛ223Ɛ532X41X7Ɛ1Ɛ30X276712946XX738X7414036-
1760560618924297064Ɛ180324775)
→ (7)(277)(4XƐ45Ɛ7)(14240XX1)(XƐ1XX9208Ɛ127)(2415806Ɛ001275ƐƐ)
(2X393611123X992597910ƐXƐ32X14Ɛ748368675X5276274127)
→ (17)(255)(Ɛ7X7)(122X1ƐƐƐXƐ)(909Ɛ95994494Ɛ)(6Ɛ910Ɛ31Ɛ51051706Ɛ)
(3808141ƐƐ4074627557X761295X494049Ɛ041053161598399X1)
→ COMPOSITE 17255Ɛ7X7122X1ƐƐƐXƐ909Ɛ95994494Ɛ6Ɛ910Ɛ31Ɛ51051706Ɛ3808141ƐƐ4-
074627557X761295X494049Ɛ041053161598399X1 (54).

28 → (2)(2)(2)(2)(2) → (2)(11111) → (5)(15)(3661) → (7)(655)(143Ɛ) → PRIME 765514 3Ɛ (4).

29 → (3)(Ɛ) → PRIME 3Ɛ (1).

2X → (2)(15) → (5)(51) → (Ɛ)(5Ɛ) → (5)(237) → PRIME 5237 (4).

2Ɛ → (5)(7) → PRIME 57 (1).

30 → (2)(2)(3)(3) → (3)(11)(81) → (25)(1345) → PRIME 251345 (3).

32 → (2)(17) → PRIME 217 (1).

33 → (3)(11) → (5)(75) → PRIME 575 (2).

34 → (2)(2)(2)(5) → (7)(7)(7)(Ɛ) → (57)(145) → (Ɛ)(11)(577) → (X87)(1051)
→ (186Ɛ)(62ƐƐ) → (17)(841)(1685) → (11XƐ)(14ƐX87) → (8Ɛ)(577)(33X7Ɛ)
→ PRIME 8Ɛ57733X7Ɛ (9).

36 → (2)(3)(7) → PRIME 237 (1).

38 → (2)(2)(Ɛ) → (15)(17) → PRIME 1517 (2).

39 → (3)(3)(5) → (Ɛ)(37) → PRIME Ɛ37 (2).

3X → (2)(1Ɛ) → PRIME 21Ɛ (1).

40 → (2)(2)(2)(2)(3) → (3)(3)(Ɛ)(321) → PRIME 33Ɛ321 (2).

41 → (7)(7) → (7)(11) → PRIME 711 (2).

42 → (2)(5)(5) → PRIME 255 (1).

43 → (3)(15) → PRIME 315 (1).

44 → (2)(2)(11) → (11)(15)(15) → (147)(95Ɛ) → (221)(77Ɛ) → PRIME 22177Ɛ (4).

46 → (2)(3)(3)(3) → (3)(7)(Ɛ)(15) → (5)(15)(17)(3Ɛ) → (5)(Ɛ)(17)(856Ɛ)
→ (5)(5)(2X18Ɛ8Ɛ) → (31)(191X8ƐƐƐ) → (5)(37)(117)(1X417) → (5)(5)(26635104Ɛ7)
→ (7)(Ɛ)(1Ɛ)(61)(X562021) → (63997)(1308Ɛ4617)
→ (7)(7)(7)(37)(7X1)(11719047) → (5)(95)(1Ɛ4214945067Ɛ7)
→ (175)(129725)(2X95ƐX1467) → (6Ɛ597)(2960Ɛ360965631)
→ (5)(7)(X4Ɛ)(5835)(113X1)(5282945) → (619075)(Ɛ387XƐƐ)(Ɛ870X22Ɛ)
→ (11)(11)(52X16395108 62Ɛ6654Ɛ) → (7)(145)(21X85)(4588425)(1846Ɛ37X1)
→ (5)(47XX671)(37Ɛ892X3X65X055X55) → (7)(57)(785)(927042Ɛ57)(343445334097)
→ (5)(15Ɛ165Ɛ53980711557X5830801Ɛ) → (14Ɛ5)(2395)(169743X1341466X6017X7Ɛ)
→ (8966964Ɛ315)(1Ɛ166949438 03478227)
→ (545)(5XƐ47)(27X9X5)(13017343292450X3X1)
→ (1338Ɛ)(18Ɛ5891)(24Ɛ143800X255X9727241Ɛ)
→ (25)(87)(111)(8762Ɛ141)(Ɛ37522303 80458X27321)
→ (25)(35)(61)(Ɛ527)(7549ƐX2813197219X47X9Ɛ3257)
→ (3Ɛ)(175313542X5)(4749131918477Ɛ0893050181)
→ PRIME 3Ɛ175313542X54749131918477Ɛ0893050181 (24).

47 → (5)(Ɛ) → PRIME 5Ɛ (1).

48 → (2)(2)(2)(7) → (5)(5)(107) → (3Ɛ)(1475) → (5)(31)(3081) → (8Ɛ7)(7057)
→ (31)(3Ɛ)(8XƐ5) → PRIME 313Ɛ8XƐ5 (6).

49 → (3)(17) → (Ɛ)(35) → (5)(5)(5)(11) → (XƐ)(5ƐƐ) → PRIME XƐ5ƐƐ (4).

4X → (2)(25) → PRIME 225 (1).

50 → (2)(2)(3)(5) → (5)(531) → PRIME 5531 (2).

52 → (2)(27) → (Ɛ)(25) → PRIME Ɛ25 (2).

53 → (3)(3)(7) → (5)(5)(17) → (6Ɛ)(95) → (5)(17)(X7) → PRIME 517X7 (4).

54 → (2)(2)(2)(2)(2)(2) → (2)(7)(11)(17)(111) → (11)(29Ɛ0189Ɛ) → (3Ɛ)(2X510361)
→ (82Ɛ)(X77)(6575) → (7)(15)(17)(637X371) → (27)(87)(347)(1180637)
→ (5)(61)(Ɛ31)(11409Ɛ04Ɛ) → (7)(11)(X27)(28607)(394X35)
→ (11)(17Ɛ)(3Ɛ4396X0172Ɛ97) → (85)(17073Ɛ)(Ɛ97106838X1)
→ (3X67)(64ƐX1)(40922607627) → (15)(95)(2X865)(XƐ455Ɛ)(13X5051)
→ (7)(131)(511)(57X55)(X13Ɛ891658Ɛ) → (4XX2225)(7ƐX46Ɛ1)(22146Ɛ9237)
→ (5)(Ɛ)(37)(61241)(1666ƐƐ)(46887X633Ɛ5) → (577)(14ƐX3Ɛ5)(8Ɛ39183X481XƐ5717)
→ (15)(5Ɛ)(19X71)(2897Ɛ)(174Ɛ35Ɛ7ƐƐ74097Ɛ)
→ (75)(13Ɛ)(34Ɛ9325)(62Ɛ9989013630X5ƐƐ91)
→ (669225)(116XƐ69510963716 23Ɛ6527395)
→ (7)(Ɛ)(61)(705)(42Ɛ467)(76211842Ɛ)(13651741XX91)
→ (7)(8Ɛ)(164426X1Ɛ30539106219Ɛ69Ɛ5Ɛ1Ɛ1795)
→ (35)(5ƐƐ095)(3103481)(Ɛ187931)(1700Ɛ8229168Ɛ45)
→ (11)(81)(293435)(1129X7014X31)(16712629Ɛ133XXƐ051)
→ (5)(5)(51)(1Ɛ97267)(123227028668Ɛ)(66X4854482357X3Ɛ85)
→ (11)(6738790715)(9179982780064618 5X52441821Ɛ27X1)
→ (15)(90Ɛ)(4384047)(X725320104Ɛ0Ɛ)(33X6711654XƐ766025Ɛ)
→ (6X7)(2010Ɛ)(76027Ɛ92687ƐX527)(208099011950Ɛ671X2931)
→ (Ɛ)(15)(105)(1727)(377945706302Ɛ)(X67902Ɛ3Ɛ9X4842X974411567)
→ (8Ɛ)(X3018X928X0699689Ɛ98661)(15624489851 51Ɛ81Ɛ0617785)
→ (5)(84809Ɛ)(26X3080ƐXƐ6134Ɛ31X612Ɛ2Ɛ848Ɛ809XƐX58955689Ɛ)
→ (75)(XƐ)(655)(16Ɛ25)(93772491)(134Ɛ77615X4984X2XX379961445990X5)
→ (25)(4Ɛ)(949656 55Ɛ)(3X13Ɛ101397175 43Ɛ)(2620547X06Ɛ6Ɛ14Ɛ70Ɛ8834Ɛ)
→ (11)(91)(6827)(10Ɛ639X75)(4Ɛ757336492 63Ɛ5064990586 2Ɛ5139301X68ƐƐ1)
→ (95)(665)(8X5137)(80X3Ɛ9Ɛ)(Ɛ01X197)(5X6Ɛ9X4706805Ɛ446Ɛ80Ɛ8Ɛ774Ɛ58ƐƐ)
→ (5)(22Ɛ44234 68203ƐX7)(X142X9267Ɛ356465533297X13386704869X22351)
→ (17)(35)(420455)(23Ɛ211035)(59X298X29X187305)(253Ɛ80XX31Ɛ294Ɛ335X8Ɛ7617)

→ (5)(16Ɛ5)(270Χ58697470Χ17)(Ɛ39Ɛ974ΧΧ6Ɛ50264Χ739408200101554415Ɛ58631)
→ (27)(31)(Ɛ0ΧƐ)(2875Ɛ971)(408658Ɛ91287707)(230ƐΧ66745618787)
(40513771312927315)
→ (5)(Ɛ)(11)(4Ɛ1)(75071)(13571Ɛ75Ɛ)(13680574ƐΧ912387)
(12Χ292Ɛ8704351828105262ΧƐƐ069Ɛ7)
→ (31)(1174Ɛ)(6Ɛ1Ɛ0643Ɛ)(3Ɛ2913933722787624 9ΧƐ)
(8Ɛ331432106Ɛ17568982436 34Ɛ863ΧƐ15)
→ (Ɛ)(35)(285)(3ƐƐ89Ɛ)(5213699Ɛ)(86472Χ6Ɛ54Χ36Χ4ΧƐ288797)
(36ΧƐ358871519Χ5578862162Χ8Ɛ71)
→ (214007962Χ012475)(3Ɛ243Χ0Ɛ42787814Χ7Χ2627)
(1438981 3Ɛ6597898405669 43937Χ82Χ012Ɛ)
→ (11)(1Ɛ47526Ɛ3657699782Ɛ4ΧƐ1967Ɛ8Χ9409Χ023Χ84Ɛ4452Χ5605435440051540359Χ077293Ɛ)
→ (21746855710095743367)(4Χ885Ɛ74512912Χ98Ɛ915076Χ35)
(131537819292ƐƐ907650Χ8392Ɛ221)
→ (347)(287678Ɛ81)(3641419Ɛ68Ɛ)(601Χ79Χ3Ɛ91)
(16ΧΧ2Ɛ78604Ɛ790Ɛ2722Ɛ61280985068511Ɛ14ƐƐ1815)
→ (673Ɛ)(253951ΧΧ43ƐƐ)
(26206200ƐΧ3825485984Χ2217Ɛ494Ɛ946055ΧΧΧ07673710197Ɛ446945ΧΧΧ495)
→ (6Ɛ1)(1447Ɛ)(137557)(428269412116331 23Χ361574235)
(16387Ɛ20241672Χ05937792636791736ΧƐ51668Ɛ5)
→ (5)(5)(8Ɛ)(45Χ7)(2678223901437)
(48221658375393 9Ɛ80382742964354Ɛ47882Ɛ1013060ΧƐ1654989ƐΧ1Ɛ4Χ3587)
→ (1Ɛ5)(82Χ197)(101147ƐƐ)(12032Χ2Χ1)(1Ɛ45150985)
(194Χ04ƐΧ5059167Χ41548168Χ5Χ9ΧƐ63Ɛ4568ΧΧƐ8275ƐΧ89785Ɛ)
→ (Ɛ2Ɛ)(2299420417)(3053Χ710157)(18011442Χ1855Ɛ8Ɛ04578991Ɛ3Χ405Ɛ61)
(226Χ2Ɛ927861335784963Χ29518759251)
→ (28Χ1)(5954Ɛ)(166Ɛ8Ɛ095ΧƐ67)
(5602Χ32710181Ɛ47063025782Χ556823Χ3Ɛ553557308841988 5Ɛ28179Ɛ6414Ɛ7895295)
→ (31)(150Ɛ)(657076638107072947)
(11Χ86629Χ48Ɛ809145844529 21Ɛ59808791546Ɛ93246ƐΧ95Ɛ73585Χ36Χ0134Χ939Χ681)
→ (17)(57)(433913487)(182836937764Ɛ215)(2Ɛ3Χ6131327756ΧƐ44704Ɛ325)
(2460310Ɛ5Χ870135717Χ97222Ɛ110897504697 44ƐƐ7)
→ (5)(5)(996Ɛ)(2056035)(Ɛ6Χ52205731 7454ΧƐ)(165171Χ474112Χ862Χ8888447)
(395Ɛ952826Χ511149754593Ɛ539937Χ905684Ɛ2Χ2505)
→ 55996Ɛ2056035Ɛ6Χ5220573174 54ΧƐ165171Χ474112Χ862Χ8888447395Ɛ952826Χ-511149754593Ɛ539937Χ905684Ɛ2Χ2505 which is COMPOSITE after 48; (**56.**) steps.

55 → (5)(11) → PRIME 511 (1).

56 → (2)(25) → PRIME 225 (1).

58 → (2)(2)(15) → PRIME 2215 (1).

59 → (3)(1Ɛ) → (5)(7)(11) → (17)(37) → (7)(291) → (11)(27)(27) → (45)(2ƐΧƐ)
→ PRIME 452ƐΧƐ (6).

5Χ → (2)(5)(7) → (5)(5Ɛ) → (7)(95) → (17)(4Ɛ) → (5)(11)(37) → (5)(7)(7)(2ƐƐ)
→ (17)(75)(591) → PRIME 452ƐΧƐ (6).

60 → (2)(2)(2)(3)(3) → (3)(5)(7)(2ƐƐ) → PRIME 3572ƐƐ (2).

62 → (2)(31) → (5)(5)(11) → (7)(11)(87) → (11Ɛ)(615)→ (7)(1ƐƐ1Ɛ)
→ (5)(5)(3533Ɛ) → PRIME 553533Ɛ (6).

63 → (3)(5)(5) → (7)(5Ɛ) → (11)(6Ɛ) → (5)(15)(1Ɛ) → (85)(737) → (17)(5421)
→ (5)(5)(Χ7)(Χ7) → (5)(Ɛ)(12461) → PRIME 5Ɛ12461 (8).

64 → (2)(2)(17) → (45)(5Ɛ) → PRIME 455Ɛ (2).

65 → (7)(Ɛ) → (5)(17) → PRIME 517 (2).

66 → (2)(3)(11) → (33)(6Ɛ) → (11)(15)(27) → (117)(Ɛ71) → (2Ɛ1)(481) → (7)(15)(25)(157)
→ (Ɛ)(27)(31)(Ɛ84Ɛ) → (181Ɛ)(681591) → PRIME 181Ɛ681591 (8).

68 → (2)(2)(2)(2)(5) → (5)(52χ1) → (Ɛ7)(577) → (7)(17Ɛ11) → (17)(46127) → (5)(3χ602Ɛ)
→ (7)(7)(397)(415) → (31)(37)(8321Ɛ) → (5)(2745)(2χ2ƐƐ) → (27)(1Ɛ7Ɛ)(103627)
→ (11)(15)(87)(24480625) → (5)(111)(24χ794χ7091) → (31)(179919064ƐƐ661)
→ (94χ1)(3Ɛ4868619581) → (5)(15)(45)(11020χ5)(33χƐ011)
→ (75)(9χ4407)(χ0Ɛ583χ136Ɛ) → (45)(361Ɛ3481)(5956229047)
→ (5)(7)(211690Ɛ)(88849χ314487) → (15)(1771047911)(25065χ8Ɛ42Ɛ)
→ (111)(30Ɛ)(9380Ɛ)(6707χ6032Ɛ71Ɛ) > (287Ɛ)(49944000042Ɛ06χχ3161)
→ (25)(87)(16χ8Ɛ4952401449ƐƐ7χ8Ɛ) → (25)(2121χ57)(5χ3χ3912333545χ91)
→ (5)(Ɛ)(61)(3χ5)(32Ɛ5506476580χχ84χƐƐ)
→ (Ɛ141261)(235545671)(29908166110Ɛ)
→ (15)(45)(95)(105)(8χ997575)(2Ɛ4708950Ɛ2077)
→ (χ7)(8Ɛ67161Ɛ)(22460χ0χχ4χ869Ɛ94036Ɛ)
→ (25)(27)(3Ɛ)(217)(4χƐ55)(16Ɛ005)(104220Ɛ)(383408457)
→ (15)(2893χ86χχ1)(357Ɛ9056641)(2211χ5499χ8χ10Ɛ)
→ (485)(8616733663χ072411)(520003463836880137)
→ (31)(105)(45Ɛ)(25657)(1725880Ɛ01ƐχƐχ6Ɛ963303702447)
→ (1185)(247Ɛ)(899χƐ)(780090χ2281)(24Ɛ6χ2173542826Ɛ25Ɛ)
→ (6Ɛ)(13χ8031)(15Ɛ5572614χ618976915776 4Ɛ9χ42217χχ1)
→ (157Ɛ1)(33051)(36117)(455747)(928505)(15407Ɛ3154274χ671855)
→ (59872004Ɛ7021χ6147)(30589890χƐ0χ482Ɛ587809917609Ɛ)
→ (5)(5)(7)(11)(1947)(17Ɛχ1046247)(15χ14Ɛ6Ɛ0χ5χ28546080Ɛ04129128χ5)
→ (Ɛ)(45)(145)(34χ03506Ɛ1)((3591538χ021Ɛ3649Ɛ2814Ɛ5Ɛ68101Ɛ008Ɛ497)
→ (7)(1543629Ɛχ7)(224Ɛ501726Ɛ)(6155Ɛ07916172828χ83672775 1887Ɛ135)
→ (33Ɛ5χ5)(4χ7χ75689468575)(Ɛ40397818χƐ150Ɛ) > (56833Ɛ00Ɛ116χ8325467)
→ (5)(5)(277987)(73315944χ80584594824474077914166321χχ0Ɛχ400397781)
→ (3χ5889712 5Ɛ270175)(14χ0χ0267χχ8152755566χ9Ɛ3089Ɛ351057457χƐ5)
→ (2741)(1Ɛ054527577)(480551Ɛ58χ34χ343Ɛ705)(1Ɛ9χ1χ61Ɛ2χ47χ8Ɛ0565809χ7)
→ (37618587)(5921χ8932721)(7χ889177 10Ɛ05)(234252χ56177841Ɛ1193χχ331χ25)
→ (5)(11)(1711)(15ƐƐ930351)(344959χ4755χ64981Ɛ3Ɛ41χ7607Ɛ8142456333430χƐ7031)
→ (28665)(56χ43321Ɛ)(1886604Ɛ8χ92χ17442217)(2413819χ84χ80χ5χ45976Ɛ242χ11471)
→ (11)(17)(81)(375585343 8525χ665)(3χχ37665Ɛ3687χ1054899Ɛ)
(1Ɛχ9Ɛ35136746Ɛ25572157χ1)
→ (25)(55291943Ɛ071978χ52028562016028302945 9Ɛ4374592095430χ57357507289 1χ25)
→ (2Ɛ0Ɛ)(4975)(11399779402 5265)(372008387469354562714 6Ɛ)
(638376954755467178Ɛ7χ0775)
→ (5)(7)(45)(8χƐ)(234Ɛ)(1374Ɛ)(3χ332690χ0Ɛ6075)(1183831216χ7924Ɛ0924Ɛ)
(344677444Ɛ33χ3Ɛ00830107)
→ (1Ɛ)(25)(2Ɛ975466χχ10495)
(4χ6062372766 5007χ5992584Ɛχ85χ077Ɛ560χ8188Ɛ8802Ɛ988672Ɛ1805)
→ (Ɛ)(Ɛ)(Ɛ)(11)(252Ɛ7)(167765)
(741χχ6234Ɛ512852230989 82χ80χ97357108279619564 6Ɛ13χ03596202χƐƐ65)
→ (271)(153308χ77Ɛ97)(5Ɛχ7867805χ5Ɛ)
(653Ɛ92χ4426457χ5Ɛ7981661452Ɛ2Ɛ5χ5Ɛ022755268486 6161371)
→ (7)(Ɛ)(35)(35)(251)(6807)(355χƐ)
(109Ɛ870790028357 1Ɛ9259χ82283589635379549695χ44Ɛ64χ49Ɛ7892χ714χ8621)
→ (5)(2118335)(1Ɛ7χ39261)(1174673Ɛ251Ɛ)(713χ437973845)
(6χ454541Ɛ188χ2χ49χ0982Ɛ9Ɛ4Ɛ3χ48Ɛ0χ639Ɛ9055χ07)
→ (5)(5)(35)(2485)(22523530χ1069721125944Ɛ0χ5)
(17χ530438χ65χ3039543473χ62439χ7Ɛ7128Ɛ9553Ɛ942015864Ɛ35Ɛ)
→ 3Ɛ4554523χ52χƐ201079Ɛ5χ8Ɛ0336112Ɛ87083χχχ992564872335 5χ3379341χ517580
χ2408 984230800778288 2365 → COMPOSITE (49).

69 → (3)(3)(3)(3) → (3)(5)(11)(25) → (435)(971) → PRIME 435971 (3).

6Ӿ → (2)(35) → (7)(3Ɛ) → continues as in HP[26]. We arrive at the integer 17255Ɛ7Ӿ7122Ӿ1ƐƐ-ƐӾƐ909Ɛ95994494Ɛ6Ɛ910Ɛ31Ɛ51051706Ɛ3808141ƐƐ4074627557Ӿ761295Ӿ494049Ɛ0410-53161598399Ӿ1 which is COMPOSITE after 54; (**64.**) steps.

70 → (2)(2)(3)(7) → (7)(391) → PRIME 7391 (2).

71 → (5)(15) → (Ɛ)(57) → (11)(Ӿ7) → PRIME 11Ӿ7 (3).

72 → (2)(37) → PRIME 237 (1).

73 → (3)(25) → PRIME 325 (1).

74 → (2)(2)(2)(Ɛ) → PRIME 222Ɛ (1).

76 → (2)(3)(3)(5) → PRIME 2335 (1).

77 → (7)(11) → PRIME 711 (1).

78 → (2)(2)(1Ɛ) → PRIME 221Ɛ (1).

79 → (3)(27) → PRIME 327 (1).

7Ӿ → (2)(3Ɛ) → (5)(57) → PRIME 557 (2).

7Ɛ → (5)(17) → PRIME 517 (1).

80 → (2)(2)(2)(2)(2)(3) → (3)(3)(12Ɛ)(241) → (5)(5)(307)(61Ӿ7) → (Ɛ)(5Ɛ22Ӿ465)
→ (1Ɛ)(Ɛ7)(1Ɛ1)(3291) → (25)(169Ɛ)(63Ӿ307) → (1Ӿ3451)(1383317)
→ (7)(25)(35)(47615Ɛ941) → (17)(18Ɛ)(273Ӿ262Ӿ795) → (7)(4Ɛ)(681309Ӿ5Ɛ3871)
→ (Ӿ37)(877Ɛ0Ӿ3712567) → (11)(81)(35891)(408816007)
→ PRIME 118135891408816007 (10).

82 → (2)(7)(7) → PRIME 277 (1).

83 → (3)(3)(Ɛ) → PRIME 33Ɛ (1).

84 → (2)(2)(5)(5) → (11)(205) → (7)(1Ӿ6Ɛ) → PRIME 71Ӿ6Ɛ (3).

86 → (2)(3)(15) → (5)(Ɛ)(5Ɛ) → (5)(25)(5Ɛ) → PRIME 5255Ɛ (3).

88 → (2)(2)(2)(11) → (22)(Ӿ17) → (7)(7)(797) → PRIME 77797 (3).

89 → (3)(5)(7) → PRIME 357 (1).

8Ӿ → (2)(45) → (Ɛ)(27) → (5)(15)(17) → (12Ɛ)(415) → (5)(2ƐӾ51) → (315)(1825)
→ (871)(4435) → (7)(17)(93785) → (Ӿ95)(7Ɛ371) → (11)(61)(177901) → (771)(1943251)
→ (35)(Ӿ4Ɛ)(2689Ӿ7) → (5)(5)(7)(7)(175)(277)(11Ӿ5) → (1635)(370Ӿ78866Ɛ1)
→ (3Ɛ)(107)(Ӿ4Ɛ07)(51710Ɛ) → (5)(58Ӿ527)(178366Ӿ101)
→ (37)(3Ӿ55)(71Ɛ667)(7Ɛ32Ӿ5) → (7)(30665)(158275)(1466Ӿ3ƐƐ)
→ (11Ɛ4229255)(62Ӿ983Ӿ5027) → PRIME 11Ɛ422925562Ӿ983Ӿ5027 (17).

90 → (2)(2)(3)(3)(3) → (3)(31)(2Ӿ1) → (255)(13Ɛ5) → (5)(7)(Ӿ1097) → PRIME 57Ӿ1097 (4).

92 → (2)(5)(Ɛ) → PRIME 25Ɛ (1).

93 → (3)(31) → (7)(57) → (5)(5)(37) → PRIME 5537 (3).

94 → (2)(2)(2)(2)(7) → PRIME 22227 (1).

96 → (2)(3)(17) → PRIME 2317 (1).

97 → (5)(1Ɛ) → PRIME 51Ɛ (1).

98 → (2)(2)(25) → (7)(7)(7)(Ɛ) → (57)(145) → (Ɛ)(11)(577) → (Ӿ87)(1051)
→ (186Ɛ)(62ƐƐ) → (17)(841)(1685) → (11ӾƐ)(14ƐӾ87) → (8Ɛ)(577)(33Ӿ7Ɛ)
→ PRIME 8Ɛ57733Ӿ7Ɛ (9).

99 → (3)(3)(11) → (11)(301) → (7)(1Ӿ87) → (Ɛ)(87)(ӾƐ) → (75)(16Ɛ7)
→ (5)(159ӾƐƐ) → (91)(6928Ɛ) → PRIME 916928Ɛ (9).

9X → (2)(4Ɛ) → PRIME 24Ɛ (1).

9Ɛ → (7)(15) → (5)(5)(35) → (7)(15)(67) → (7)(15)(15)(61) → (7)(37)(34X51) → (1Ɛ)(301)(1324Ɛ) → (11)(1956668 5Ɛ) → (7)(37)(67)(Ɛ571X5) → (3Ɛ)(XXƐ)(2073915) → (7)(82Ɛ)(1245)(83X35) → (91)(X1X4394Ɛ065) → (5)(1Ɛ5)(Ɛ312349295) → PRIME 51Ɛ5Ɛ312349295 (10).

X0 → (2)(2)(2)(3)(5) → (11Ɛ)(1X7) → (11)(15)(90Ɛ) → (75)(19297) → (15)(52Ɛ16Ɛ) → (5)(7)(1Ɛ)(3151Ɛ) → (37)(2X95)(6571) → (5)(5)(Ɛ)(3Ɛ)(5945X1) → (7)(665)(871)(201ƐƐ) → (5)(9X17)(1X0X6481) → (5)(91)(107Ɛ)(155XƐ2X7) → (17)(41097)(X80910087) → (2297145)(87Ɛ0X584Ɛ) → PRIME 229714587Ɛ0X584Ɛ (11).

X1 → (Ɛ)(Ɛ) → (Ɛ)(11) → PRIME Ɛ11 (2).

X2 → (2)(51) → PRIME 251 (1).

X3 → (3)(35) → (Ɛ)(37) → PRIME Ɛ37 (2).

X4 → (2)(2)(27) → (5)(5)(107) → (3Ɛ)(1475) → (5)(31)(3081) → (8Ɛ7)(7057) → (31)(3Ɛ)(8XƐ5) → PRIME 313Ɛ8XƐ5 (6).

X5 → (5)(5)(5) → (5)(111) → (17)(327) → (5)(3X2Ɛ) → PRIME 53X2Ɛ (4).

X6 → (2)(3)(3)(7) → PRIME 2337 (1).

X8 → (2)(2)(2)(2)(2)(2)(2) → (2)(46Ɛ)(2X3Ɛ) → PRIME 246Ɛ2X3Ɛ (2).

X9 → (3)(37) → (5)(5)(17) → (6Ɛ)(95) → (5)(17)(X7) → PRIME 517X7 (4).

XX → (2)(5)(11) → (4Ɛ)(5Ɛ) → (11)(46Ɛ) → (17)(855) → (67)(2ƐƐ) → PRIME 672ƐƐ (5).

Ɛ0 → (2)(2)(3)(Ɛ) → (15)(167) → PRIME 15167 (2).

Ɛ1 → (7)(17) → (11)(67) → PRIME 1167 (2).

Ɛ2 → (2)(57) → (5)(5Ɛ) → (7)(95) → (17)(4Ɛ) → (5)(11)(37) → (5)(7)(7)(2ƐƐ) → (17)(75)(591) → PRIME 1775591 (7).

Ɛ3 → (3)(3)(3)(5) → PRIME 3335 (1).

Ɛ4 → (2)(2)(2)(15) → PRIME 22215 (1).

Ɛ6 → (2)(3)(1Ɛ) → PRIME 231Ɛ (1).

Ɛ8 → (2)(2)(5)(7) → (31)(87) → PRIME 3187 (2).

Ɛ9 → (3)(3Ɛ) → PRIME 33Ɛ (1).

ƐX → (2)(5Ɛ) → PRIME 25Ɛ (1).

ƐƐ → (Ɛ)(11) → PRIME Ɛ11 (1).

100 → (2)(2)(2)(2)(3)(3) → (3)(11)(8081) → (Ɛ)(27)(35)(471) → (1Ɛ)(5Ɛ)(ƐX531) → (1Ɛ)(205)(60387) → (5)(37)(21Ɛ1)(7225) → (181)(3200119X5) → (171)(2221)(596815) → PRIME 1712221596815 (8).

Editor's Note: This data is current as of 27 November 2010.

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