Tables of Parameters of BIBDs with $r \leq 41$ Including Existence, Enumeration and Resolvability Results: An Update

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1. Introduction.

A *balanced incomplete block design* (BIBD) is a pair (V, B) where V is a v-set and B is a collection of b k-subsets of V called *blocks* such that each element of V is contained in exactly r blocks and any 2-subset of V is contained in exactly λ blocks. The numbers v, b, r, k, λ are *parameters* of the BIBD. Trivial necessary conditions for the existence of a BIBD (v, b, r, k, λ) are

(1) $vr = bk$,
(2) $r(k - 1) = \lambda(v - 1)$.

Parameter sets that satisfy (1) and (2) are *admissible*.

A BIBD (V, B) is *resolvable* if there exists a partition R of its set of blocks B into subsets called *parallel classes* each of which in turn partitions the set V; R is called a *resolution*. An additional trivial necessary condition for the existence of a resolvable BIBD is

(3) $k \mid v$.

Two BIBDs (V_1, B_1), (V_2, B_2) are *isomorphic* if there exists a bijection $a: V_1 \to V_2$ such that $B_1 a = B_2$. Isomorphism of resolutions of BIBDs is defined similarly.

Given a symmetric BIBD (one with $v = b, r = k$), one obtains from it the *residual design* by deleting all elements of one block, and the *derived design* by deleting all elements of the complement of one block. The parameters of the former are $(v - k, v - 1, k, k - \lambda, \lambda)$ while those of the latter are $(k, v - 1, k - 1, \lambda, \lambda - 1)$. A BIBD is *nontrivial* if $3 \leq k < v$; such designs satisfy Fisher's inequality $b \geq v$. Given a BIBD (v, b, r, k, λ), any BIBD $(v, mb, mr, k, m\lambda)$ is termed its *m-multiple*. (Repeated blocks are permitted.)

We present here a listing of admissible parameter sets of nontrivial BIBDs with $r \leq 41$ and $k \leq v/2$. The most extensive previous list appears to be that of DiPaola, Wallis and Wallis [D] although another extensive listing of designs classified according to v and k was compiled by Collens (for a brief history of tables and listings of BIBDs, see [D]). However, our present listing differs from that of

[D] not only that it extends it up to $r \leq 41$, which more than doubles its size, but also in that it includes information concerning enumeration of BIBDs, and existence and enumeration of resolvable BIBDs. Our sources were, of course, mainly the existing lists. Several recent journal articles and reports provided additional source of information. We adopted the principle of giving only a "minimal set" of references which results, in particular, in an omission of several earlier listings from references. From our point of view, the listings of Hall, Takeuchi, DiPaola-Wallis-Wallis, and Kageyama (for resolvable designs) as well as papers by Hanani and Wilson are basic, and are referred to by letters while the remaining references are referred to by numbers. Unlike most of the earlier lists, we include also multiples of known designs; although their existence is trivially implied, information concerning their number and resolvability usually is not.

2. Description of the Tables.

The admissible parameter sets of nontrivial BIBDs satisfying $r \leq 41$, $3 \leq k \leq v/2$ and conditions (1), (2) are ordered lexicographically by r, k and λ (in this order). Thus, the numbering in our list bears no relation to numbering in any of the earlier listings.

The column Nd contains the number $Nd(v, b, r, k, \lambda)$ of pairwise nonisomorphic BIBD (v, b, r, k, λ)'s or the best known lower bound for this number. The column Nr contains a dash - if condition (3) is not satisfied. Otherwise, it contains the number Nr of pairwise nonisomorphic resolutions of BIBD (v, b, r, k, λ)'s or the best known lower bound for this number. Note that Nr is not necessarily the number of nonisomorphic resolvable BIBDs as two nonisomorphic resolutions can have isomorphic underlying (resolvable) design. To illustrate the difference, there are 7 nonisomorphic resolutions of BIBD $(15, 35, 7, 3, 1)$'s but only 4 nonisomorphic resolvable BIBD $(15, 35, 7, 3, 1)$'s (see No. 14).

The symbol ? indicates that the existence of the corresponding BIBD (resolvable BIBD, respectively) is in doubt.

The meaning of symbols that occur in the column "Comments" is as follows:

m# x : m-multiple of an existing BIBD No. x;

m# x* : m-multiple of No.x which does not exist or whose existence is undecided;

R# x (D# x) : residual (derived) design of No. x which exists;

R# x* (D# x*) : residual (derived) design of No. x which does not exist or whose existence is undecided;

PG(AG) : projective (affine) geometry;

NE1 : BIBD does not exist by Bruck-Ryser theorem;

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NE2 : BIBD is a residual of a BIBD that does not exist by Bruck-Ryser theorem, and $\lambda = 1$ or 2;

NE3 : resolvable BIBD does not exist by Bose's condition;

HD : resolvable BIBD $(4t, 8t - 2, 4t - 1, 2t, 2t - 1)$ exists as there exists a symmetric (Hadamard) BIBD $(4t - 1, 4t - 1, 2t - 1, 2t - 1, t - 1)$.

In the column "References", there are no references given for designs that are multiples of known BIBDs. We use often the trivial formula giving $Nd(v, mb, mr, k, m\lambda) \geq n + 1$ provided $Nd(v, b, r, k, \lambda) \geq n$, $m \geq 2$, $n \geq 1$ (and similarly for Nr).

Acknowledgements.

Six years later ...

The original version of these tables appeared in *Annals of Discrete Mathematics* 26 (1985), 275–308. Since the submission of the original version, many new designs were discovered and improvements were made. We attempted to incorporate all of these changes in the present update.

Table. (v, b, r, k, λ) designs with r≤41

No	v	b	r	k	λ	Nd	Nr	Comments	References
1	7	7	3	3	1	1	-	PG	[H]
2	9	12	4	3	1	1	1	R#3,AG	[H]
3	13	13	4	4	1	1	-	PG	[H]
4	6	10	5	3	2	1	0	R#7,NE3	[H]
5	16	20	5	4	1	1	1	R#6,AG	[H]
6	21	21	5	5	1	1	-	PG	[H]
7	11	11	5	5	2	1	-		[H]
8	13	26	6	3	1	2	-		[75]
9	7	14	6	3	2	4	-	2#1,D#20	[90]
10	10	15	6	4	2	3	-	R#13	[H,90]
11	25	30	6	5	1	1	1	R#12,AG	[H]
12	31	31	6	6	1	1	-	PG	[H]
13	16	16	6	6	2	3	-		[H,35]
14	15	35	7	3	1	80	7	PG	[H,K,75]
15	8	14	7	4	3	4	1	R#20,AG	[H,K,35,103]
16	15	21	7	5	2	0	0	R#19*,NE2	[H]
17	36	42	7	6	1	0	0	R#18*,NE2,AG	[H]
18	43	43	7	7	1	0	-	NE1,PG	[H]
19	22	22	7	7	2	0	-	NE1	[H]
20	15	15	7	7	3	5	-	PG	[H,90]
21	9	24	8	3	2	36	9	2#2,D#40	[76,89]
22	25	50	8	4	1	≥16	-		[H,68]
23	13	26	8	4	2	2407	-	2#3	[74]
24	9	18	8	4	3	11	-	D#41	[H,35,70]
25	21	28	8	6	2	0	-	R#28*,NE2	[H]
26	49	56	8	7	1	1	1	R#27,AG	[H]
27	57	57	8	8	1	1	-	PG	[H]
28	29	29	8	8	2	0	-	NE1	[H]
29	19	57	9	3	1	≥2395687	-		[H,104]
30	10	30	9	3	2	960	-	D#54	[H,22,34,49]
31	7	21	9	3	3	10	-	3#1	[89]
32	28	63	9	4	1	≥145	≥7		[H,K,15,16,78]
33	10	18	9	5	4	21	0	R#41,NE3	[H,35,70]
34	46	69	9	6	1	?	-		
35	16	24	9	6	3	≥1512	-	R#40	[H,96]
36	28	36	9	7	2	7	0	R#39,NE3	[H,2]
37	64	72	9	8	1	1	1	R#38,AG	[H]
38	73	73	9	9	1	1	-	PG	[H]
39	37	37	9	9	2	4	-		[H,2]
40	25	25	9	9	3	78	-		[H,31]
41	19	19	9	9	4	6	-		[H,35]
42	21	70	10	3	1	$≥2×10^6$	≥113		[H,K,77,93,115]
43	6	20	10	3	4	4	-	2#4	[K,40]
44	16	40	10	4	2	≥986	≥10	2#5	[78,124]
45	41	82	10	5	1	≥5	-		[H,124]

No	v	b	r	k	λ	Nd	Nr	Comments	References
46	21	42	10	5	2	≥ 10	-	2#6	[78]
47	11	22	10	5	4	4393	-	2#7,D#63	[12]
48	51	85	10	6	1	?	-		
49	21	30	10	7	3	≥ 414	0	R#54,NE3	[H,K,73]
50	36	45	10	8	2	0	-	R#53*,NE2	[H]
51	81	90	10	9	1	7	7	R#52,AG	[H,27,122]
52	91	91	10	10	1	4	-	PG	[H,27,122]
53	46	46	10	10	2	0	-	NE1	[H]
54	31	31	10	10	3	≥ 38	-		[H,73]
55	12	44	11	3	2	$\geq 10^6$	≥ 2	D#84	[H,K,26,97]
56	12	33	11	4	3	$\geq 10^3$	≥ 1	D#85*	[H,K,24,124]
57	45	99	11	5	1	≥ 16	?		[H,78]
58	12	22	11	6	5	601	1	R#63,HD	[H,K,49]
59	45	55	11	9	2	≥ 11	0	R#62,NE3	[K,29]
60	100	110	11	10	1	0	0	R#61*,AG	[121]
61	111	111	11	11	1	0	-	PG	[121]
62	56	56	11	11	2	≥ 5	-		[53]
63	23	23	11	11	5	1103	-		[H,48,65]
64	25	100	12	3	1	$\geq 10^{14}$	-		[H,75]
65	13	52	12	3	2	≥ 92714	-	2#8,D#96	[78]
66	9	36	12	3	3	22521	≥ 395	3#2	[125]
67	7	28	12	3	4	35	-	4#1	[40]
68	37	111	12	4	1	≥ 3	-		[H,23]
69	19	57	12	4	2	≥ 423	-		[H,124]
70	13	39	12	4	3	$\geq 10^3$	-	3#3,D#97	[78]
71	10	30	12	4	4	>998	-	2#10	[124]
72	25	60	12	5	2	≥ 28	≥ 28	2#11	[59]
73	61	122	12	6	1	?	-		
74	31	62	12	6	2	≥ 72	-	2#12	[61]
75	21	42	12	6	3	≥ 1	-		[H]
76	16	32	12	6	4	≥ 111	-	2#13	[58]
77	13	26	12	6	5	≥ 1017	-	D#98	[H,9,124]
78	22	33	12	8	4	?	-	R#85*	
79	33	44	12	9	3	≥ 3375	-	R#84	[T,80]
80	55	66	12	10	2	0	-	R#83*,NE2	[H]
81	121	132	12	11	1	≥ 1	≥ 1	R#82,AG	[H]
82	133	133	12	12	1	≥ 1	-	PG	[H]
83	67	67	12	12	2	0	-	NE1	[H]
84	45	45	12	12	3	≥ 2649	-		[T,80]
85	34	34	12	12	4	0	-	NE1	[H]
86	27	117	13	3	1	$\geq 10^{11}$	≥ 909	AG	[H,K,50,75,117]
87	40	130	13	4	1	$\geq 10^6$	≥ 1	PG	[H,K,16]
88	66	143	13	6	1	≥ 1	?		[30]
89	14	26	13	7	6	≥ 79	0	R#98,NE3	[K,T,94,124]
90	27	39	13	9	4	≥ 119	≥ 12	R#97,AG	[H,K,16]
91	40	52	13	10	3	?	0	R#96*,NE3	[K]
92	66	78	13	11	2	≥ 2	0	R#95,NE3	[K,1]
93	144	156	13	12	1	?	?	R#94*,AG	
94	157	157	13	13	1	?	-	PG	
95	79	79	13	13	2	≥ 2	-		[1]

No	v	b	r	k	λ	Nd	Nr	Comments	References
96	53	53	13	13	3	0	-	NE1	[H]
97	40	40	13	13	4	≥24	-	PG	[H,42]
98	27	27	13	13	6	≥7	-		[H,106]
99	15	70	14	3	2	≥685521	≥21	2#14,D#140	[78]
100	22	77	14	4	2	≥7921	-		[H,33]
101	8	28	14	4	6	2224	4	2#15	[39,78]
102	15	42	14	5	4	≥103	?	2#16*,D141*	[H,47,79]
103	36	84	14	6	2	≥4	≥2	2#17*	[H,K,60]
104	15	35	14	6	5	≥117	-	D#142	[H,124]
105	85	170	14	7	1	?	-		
106	43	86	14	7	2	≥3	-	2#18*	[H,60]
107	29	58	14	7	3	≥1	-		[H]
108	22	44	14	7	4	≥1	-	2#19*	[32]
109	15	30	14	7	6	≥11	-	2#20,D#143	[116]
110	78	91	14	12	2	0	-	R#113*,NE2	[H]
111	169	182	14	13	1	≥1	≥1	AG	[H]
112	183	183	14	14	1	≥1	-	PG	[H]
113	92	92	14	14	2	0	-	NE1	[H]
114	31	155	15	3	1	$\geq 6 \times 10^{16}$	-		[H,78]
115	16	80	15	3	2	$\geq 10^{13}$	-	D#169	[H,78]
116	11	55	15	3	3	≥436800	-		[H,78]
117	7	35	15	3	5	108	-	5#1	[49]
118	6	30	15	3	6	6	0	3#4	[40,78]
119	16	60	15	4	3	$\geq 6 \times 10^{5}$	$\geq 6 \times 10^{5}$	3#5,D#170	[78]
120	61	183	15	5	1	≥10	-		[H,23]
121	31	93	15	5	2	≥1	-		[H]
122	21	63	15	5	3	$\geq 10^{9}$	-	3#6	[16]
123	16	48	15	5	4	≥11	-	D#171	[H,17]
124	13	39	15	5	5	≥30	-		[H,110]
125	11	33	15	5	6	≥127	-	3#7	[11,58]
126	76	190	15	6	1	≥1	-		[88]
127	26	65	15	6	3	≥1	-		[H]
128	16	40	15	6	5	≥15	-	D#172	[H,124]
129	91	195	15	7	1	≥2	?		[H,7]
130	16	30	15	8	7	$\geq 9 \times 10^{7}$	≥5	R#143,AG,HD	[H,K,66]
131	21	35	15	9	6	$\geq 10^{4}$	-	R#142	[H,18]
132	136	204	15	10	1	?	-		
133	46	69	15	10	3	?	-		
134	28	42	15	10	5	≥1	-	R#141*	[123]
135	56	70	15	12	3	≥4	-	R#140	[42]
136	91	105	15	13	2	0	0	R#139*,NE2	[H]
137	196	210	15	14	1	0	0	R#138*,NE2,AG	[H]
138	211	211	15	15	1	0	-	NE1,PG	[H]
139	106	106	15	15	2	0	-	NE1	[H]
140	71	71	15	15	3	≥8	-		[42]
141	43	43	15	15	5	0	-	NE1	[H]
142	36	36	15	15	6	≥16448	-		[T,18]
143	31	31	15	15	7	≥1266891	-	PG	[H,91]
144	33	176	16	3	1	$\geq 10^{13}$	≥1		[T,K,78]
145	9	48	16	3	4	≥330	≥9	4#2	[49]

No	v	b	r	k	λ	Nd	Nr	Comments	References
146	49	196	16	4	1	≥ 236	-		[T,23,41]
147	25	100	16	4	2	≥ 17	-	2#22	
148	17	68	16	4	3	≥ 1	-	D#185	[T]
149	13	52	16	4	4	≥ 2408	-	4#3	
150	9	36	16	4	6	≥ 12	-	2#24	
151	65	208	16	5	1	≥ 2	≥ 1		[K,T,20,23]
152	81	216	16	6	1	?	-		
153	21	56	16	6	4	≥ 1	-	2#25*	[Han]
154	49	112	16	7	2	≥ 1	≥ 1	2#26	
155	113	226	16	8	1	?	-		
156	57	114	16	8	2	≥ 1362	-	2#27	[61]
157	29	58	16	8	4	≥ 2	-	2#28*	[T,96]
158	17	34	16	8	7	≥ 11	-	D#186	[T,111]
159	145	232	16	10	1	?	-		
160	25	40	16	10	6	≥ 43	-	R#172	[13,64,113]
161	33	48	16	11	5	≥ 19	0	R#171,NE3	[K,17]
162	177	236	16	12	1	?	-		
163	45	60	16	12	4	≥ 1	-	R#170	[5]
164	65	80	16	13	3	?	0	R#169*,NE3	[K]
165	105	120	16	14	2	?	-	R#168*	
166	225	240	16	15	1	?	?	R#167*,AG	
167	241	241	16	16	1	?	-	PG	
168	121	121	16	16	2	?	-		
169	81	81	16	16	3	?	-		
170	61	61	16	16	4	≥ 1	-		[5]
171	49	49	16	16	5	≥ 44	-		[67]
172	41	41	16	16	6	≥ 2	-		[13,107,112]
173	18	102	17	3	2	$\geq 4\times 10^{14}$	≥ 1	D#217*	[T,20,44,78]
174	52	221	17	4	1	≥ 206	≥ 1		[K,T,23]
175	35	119	17	5	2	≥ 1	?		[T]
176	18	51	17	6	5	≥ 3	≥ 2	D#218*	[T,54,62]
177	35	85	17	7	3	≥ 1	?		[45,78]
178	120	255	17	8	1	≥ 1	≥ 1		[100]
179	18	34	17	9	8	$\geq 10^3$	0	R#186,NE3	[K,T,18]
180	52	68	17	13	4	≥ 1	0	R#185,NE3	[K,D]
181	120	136	17	15	2	0	0	R#184*,NE2	[H]
182	256	272	17	16	1	≥ 189	≥ 189	R#183,AG	[H,55,56]
183	273	273	17	17	1	≥ 13	-	PG	[H,55,56]
184	137	137	17	17	2	0	-	NE1	[H]
185	69	69	17	17	4	≥ 1	-		[D]
186	35	35	17	17	8	≥ 1853	-		[T,18]
187	37	222	18	3	1	$\geq 10^{10}$	-		[T,20,69]
188	19	114	18	3	2	$\geq 2\times 10^9$	-	2#29,D#231*	[78]
189	13	78	18	3	3	$\geq 3\times 10^9$	-	3#8	[78]
190	10	60	18	3	4	≥ 961	-	2#30	
191	7	42	18	3	6	417	-	6#1	[49]
192	28	126	18	4	2	≥ 139	≥ 8	2#32	
193	10	45	18	4	6	≥ 14819	-	3#10	[78]
194	25	90	18	5	3	$\geq 10^{17}$	$\geq 10^{17}$	3#11	[78]
195	10	36	18	5	8	≥ 1000	7	2#33	[K,35,124]

No	v	b	r	k	λ	Nd	Nr	Comments	References
196	91	273	18	6	1	≥ 4	-		[Han,21,85]
197	46	138	18	6	2	≥ 1	-	2#34*	[Han]
198	31	93	18	6	3	$\geq 10^{22}$	-	3#12	[78]
199	19	57	18	6	5	≥ 1	-	D#232*	[T]
200	16	48	18	6	6	$\geq 10^8$	-	3#13,2#35	[78]
201	28	72	18	7	4	≥ 392	?	2#36	[58]
202	64	144	18	8	2	≥ 121	≥ 121	2#37	[59]
203	145	290	18	9	1	?	-		
204	73	146	18	9	2	≥ 3500	-	2#38	[61]
205	49	98	18	9	3	?	-		
206	37	74	18	9	4	≥ 852	-	2#39	[58]
207	25	50	18	9	6	≥ 79	-	2#40	
208	19	38	18	9	8	≥ 7	-	2#41,D#233	
209	55	99	18	10	3	?	-		
210	100	150	18	12	2	?	-		
211	34	51	18	12	6	≥ 2	-	R#218*	[38]
212	85	102	18	15	3	?	-	R#217*	
213	136	153	18	16	2	?	-	R#216*	
214	289	306	18	17	1	≥ 1	≥ 1	R#215,AG	[H]
215	307	307	18	18	1	≥ 1	-	PG	[H]
216	154	154	18	18	2	?	-		
217	103	103	18	18	3	0	-	NE1	[H]
218	52	52	18	18	6	0	-	NE1	[H]
219	39	247	19	3	1	$\geq 10^{44}$	≥ 88		[K,T,69,105]
220	20	95	19	4	3	≥ 1	≥ 3	D#270	[T,26]
221	20	76	19	5	4	≥ 1	≥ 2	D#271*	[Han,T,26]
222	96	304	19	6	1	≥ 1	?		[86]
223	153	323	19	9	1	?	?		
224	20	38	19	10	9	$\geq 10^{16}$	3	R#233,HD	[66]
225	39	57	19	13	6	?	0	R#232*,NE3	[K]
226	96	114	19	16	3	?	0	R#231*,NE3	[K]
227	153	171	19	17	2	0	0	R#230*,NE2	[H]
228	324	342	19	18	1	?	?	R#229*,AG	
229	343	343	19	19	1	?	-	PG	
230	172	172	19	19	2	0	-	NE1	[H]
231	115	115	19	19	3	?	-		
232	58	58	19	19	6	0	-	NE1	[H]
233	39	39	19	19	9	≥ 38	-		[6]
234	21	140	20	3	2	$\geq 5 \times 10^{14}$	≥ 79	2#42,D#307	[78]
235	9	60	20	3	5	≥ 330	≥ 9	5#2	
236	6	40	20	3	8	13	1	4#4	[49]
237	61	305	20	4	1	≥ 18132	-		[T,20,23]
238	31	155	20	4	2	≥ 1	-		[T]
239	21	105	20	4	3	≥ 1	-	D#308*	[T]
240	16	80	20	4	4	$\geq 6 \times 10^5$	$\geq 6 \times 10^5$	4#5	[78]
241	13	65	20	4	5	$\geq 10^3$	-	5#3	[78]
242	11	55	20	4	6	≥ 1	-		[T]
243	81	324	20	5	1	≥ 1	-		[T]
244	41	164	20	5	2	≥ 6	-	2#45	
245	21	84	20	5	4	$\geq 10^9$	-	4#6,D#309	[78]

No	v	b	r	k	λ	Nd	Nr	Comments	References
246	17	68	20	5	5	≥ 1	-		[T,20]
247	11	44	20	5	8	≥ 4394	-	4#7	
248	51	170	20	6	2	≥ 1	-	2#48*	[Han]
249	21	70	20	6	5	≥ 1	-	D#310	[Han]
250	21	60	20	7	6	≥ 415	?	2#49,D#311*	
251	36	90	20	8	4	≥ 1	-	2#50*	[38]
252	81	180	20	9	2	≥ 1169	≥ 1169	2#51	[59]
253	181	362	20	10	1	?	-		
254	91	182	20	10	2	≥ 46790	-	2#52	[61]
255	61	122	20	10	3	?	-		
256	46	92	20	10	4	?	-	2#53*	
257	37	74	20	10	5	≥ 1	-		[T]
258	31	62	20	10	6	≥ 39	-	2#54	
259	21	42	20	10	9	≥ 4	-	D#312	[T,8]
260	111	185	20	12	2	?	-		
261	45	75	20	12	5	?	-		
262	141	188	20	15	2	?	-		
263	57	76	20	15	5	?	-	R#271	
264	36	48	20	15	8	≥ 1	-		[102]
265	76	95	20	16	4	≥ 1	-	R#270	[T,20]
266	171	190	20	18	2	?	-	R#269*	
267	361	380	20	19	1	≥ 1	≥ 1	R#268,AG	[H]
268	381	381	20	20	1	≥ 1	-	PG	[H]
269	191	191	20	20	2	?	-		
270	96	96	20	20	4	≥ 2	-		[T,99]
271	77	77	20	20	5	0	-	NE1	[H]
272	43	301	21	3	1	$\geq 5 \times 10^{64}$	-		[Han,69]
273	22	154	21	3	2	$\geq 3 \times 10^{9}$	-	D#336*	[Han,78]
274	15	105	21	3	3	$\geq 10^{15}$	$\geq 10^{11}$	3#14	[78]
275	8	56	21	3	6	≥ 101	-		[40]
276	7	49	21	3	7	≥ 9	-	7#1	
277	64	336	21	4	1	≥ 12048	≥ 1		[Han,23,46]
278	8	42	21	4	9	≥ 943	10	3#15	[39,49,78]
279	85	357	21	5	1	≥ 10	≥ 1	PG	[H,23]
280	15	63	21	5	6	≥ 2211	≥ 149	3#16*	[Han,79]
281	106	371	21	6	1	≥ 1	-		[84]
282	36	126	21	6	3	≥ 1	?	3#17*	[Han]
283	22	77	21	6	5	≥ 1	-	D#337	[Han]
284	16	56	21	6	7	≥ 1	-		[Han,101]
285	127	381	21	7	1	?	-		
286	64	192	21	7	2	?	-		
287	43	129	21	7	3	≥ 1	-	3#18*	[W]
288	22	66	21	7	6	≥ 1	-	3#19*,D#338*	[Han]
289	19	57	21	7	7	≥ 1	-		[W]
290	15	45	21	7	9	$\geq 10^{8}$	-	3#20	[78]
291	57	133	21	9	3	?	-		
292	190	399	21	10	1	?	?		
293	22	42	21	11	10	≥ 2	0	R#312,NE3	[K,T,43]
294	232	406	21	12	1	?	-		
295	274	411	21	14	1	?	-		

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No	v	b	r	k	λ	$\bar{N}d$	Nr	Comments	References
296	92	138	21	14	3	?	-		
297	40	60	21	14	7	?	-	R#311*	
298	295	413	21	15	1	?	-		
299	50	70	21	15	6	≥1	-	R#310	[52]
300	64	84	21	16	5	≥157	≥157	R#309,AG	[H,T,57]
301	85	105	21	17	4	?	0	R#308*,NE3	[K]
302	120	140	21	18	3	?	-	R#307*	
303	190	210	21	19	2	?	0	R#306*,NE3	[K]
304	400	420	21	20	1	?	?	R#305*,AG	
305	421	421	21	21	1	?	-	PG	
306	211	211	21	21	2	?	-		
307	141	141	21	21	3	0	-	NE1	[H]
308	106	106	21	21	4	0	-	NE1	[H]
309	85	85	21	21	5	≥213964	-	PG	[H,57]
310	71	71	21	21	6	≥2	-		[52]
311	61	61	21	21	7	0	-	NE1	[H]
312	43	43	21	21	10	≥2	-		[T,43]
313	45	330	22	3	1	$\geq 6 \times 10^{76}$	≥84		[Han,69,78]
314	12	88	22	3	4	≥20476	≥3	2#55	
315	34	187	22	4	2	≥1	-		[Han]
316	12	66	22	4	6	$\geq 10^3$	≥1	2#56	
317	45	198	22	5	2	≥17	?	2#57	
318	111	407	22	6	1	≥1	-		[86]
319	12	44	22	6	10	≥602	≥400	2#58	[11]
320	133	418	22	7	1	?	?		
321	45	110	22	9	4	≥1353	?	2#59	[58]
322	100	220	22	10	2	?	?	2#60*	
323	221	442	22	11	1	?	-		
324	111	222	22	11	2	?	-	2#61*	
325	56	112	22	11	4	≥2696	-	2#62	[58]
326	45	90	22	11	5	≥80	-		[18]
327	23	46	22	11	10	≥1103	-	2#63,D#351	
328	287	451	22	14	1	?	-		
329	45	66	22	15	7	?	0	R#338*	[27]
330	56	77	22	16	6	≥1	-	R#337	[109]
331	133	154	22	19	3	?	0	R#336*,NE3	[K]
332	210	231	22	20	2	0	-	R#335*,NE2	[H]
333	441	462	22	21	1	0	0	R#334*,NE2,AG	[H]
334	463	463	22	22	1	0	-	NE1,PG	[H]
335	232	232	22	22	2	0	-	NE1	[H]
336	155	155	22	22	3	?	-		
337	78	78	22	22	6	≥3	-		[109]
338	67	67	22	22	7	0	-	NE1	[H]
339	24	184	23	3	2	$\geq 3 \times 10^9$	≥1	D#404*	[Han,44,78]
340	24	138	23	4	3	≥1	≥1	D#405*	[Han,4]
341	24	92	23	6	5	≥1	?	D#406*	[Han]
342	70	230	23	7	2	?	?		
343	24	69	23	8	7	≥1	?	D#407	[Han]
344	70	161	23	10	3	?	?		
345	231	483	23	11	1	?	?		

No	v	b	r	k	λ	Nd	Nr	Comments	References
346	24	46	23	12	11	$\geq 4 \times 10^{17}$	≥ 129	R#351,HD	[T,48,66]
347	231	253	23	21	2	0	0	R#350*,NE2	[H]
348	484	506	23	22	1	0	0	R#349*,NE2,AG	[H]
349	507	507	23	23	1	0	-	NE1,PG	[H]
350	254	254	23	23	2	0	-	NE1	[H]
351	47	47	23	23	11	≥ 1	-		[T]
352	49	392	24	3	1	$\geq 6 \times 10^{14}$	-		[Han,69]
353	25	200	24	3	2	$\geq 10^{14}$	-	2#64,D#438*	
354	17	136	24	3	3	≥ 4968	-		[Han,78]
355	13	104	24	3	4	$\geq 10^8$	-	4#8	[78]
356	9	72	24	3	6	$\geq 10^7$	$\geq 10^5$	6#2	[78]
357	7	56	24	3	8	≥ 35	-	8#1	
358	73	438	24	4	1	$\geq 10^7$	-		[14]
359	37	222	24	4	2	≥ 4	-	2#68	
360	25	150	24	4	3	$\geq 10^{22}$	-	3#22,D#439*	[78]
361	19	114	24	4	4	≥ 424	-	2#69	
362	13	78	24	4	6	$\geq 10^8$	-	6#3	[78]
363	10	60	24	4	8	≥ 14819	-	4#10	[78]
364	9	54	24	4	9	$\geq 10^6$	-	3#24	[78]
365	25	120	24	5	4	$\geq 10^{17}$	$\geq 10^{17}$	4#11,D#440	[78]
366	121	484	24	6	1	≥ 1	-		[Han,85]
367	61	244	24	6	2	≥ 1	-	2#73*	[Han]
368	41	164	24	6	3	≥ 1	-		[Han]
369	31	124	24	6	4	$\geq 10^{22}$	-	4#12	[78]
370	25	100	24	6	5	≥ 1	-	D#441	[Han]
371	21	84	24	6	6	≥ 1	-	3#25*,2#75	
372	16	64	24	6	8	$\geq 10^8$	-	4#13	[78]
373	13	52	24	6	10	≥ 1018	-	2#77	
374	49	168	24	7	3	$\geq 10^{52}$	$\geq 10^{52}$	3#26	[78]
375	169	507	24	8	1	?	-		
376	85	255	24	8	2	?	-		
377	57	171	24	8	3	$\geq 10^{63}$	-	3#27	[78]
378	43	129	24	8	4	≥ 1	-		[W]
379	29	87	24	8	6	≥ 1	-	3#28*	[Han]
380	25	75	24	8	7	≥ 1	-	D#442*	[W]
381	22	66	24	8	8	≥ 1	-	2#78*	[Han]
382	33	88	24	9	6	≥ 3376	-	2#79	
383	55	132	24	10	4	?	-	2#80*	
384	25	60	24	10	9	≥ 3	-	D#443	[W,25]
385	121	264	24	11	2	≥ 365	≥ 365	2#81	[59]
386	265	530	24	12	1	?	-		
387	133	266	24	12	2	≥ 9979200	-	2#82	[61]
388	89	178	24	12	3	?	-		
389	67	134	24	12	4	?	-	2#83*	
390	45	90	24	12	6	≥ 2650	-	2#84	
391	34	68	24	12	8	?	-	2#85*	
392	25	50	24	12	11	≥ 10	-	D#444	[T,W,25]
393	105	180	24	14	3	?	-		
394	85	136	24	15	4	?	-		
395	46	69	24	16	8	≥ 1	-	R#407	[51]

No	v	b	r	k	λ	Nd	Nr	Comments	References
396	69	92	24	18	6	?	-	R#406*	
397	115	138	24	20	4	?	-	R#405*	
398	161	184	24	21	3	?	-	R#404*	
399	49	56	24	21	10	≥ 1	-		[W]
400	253	276	24	22	2	0	-	R#403*,NE2	[H]
401	529	552	24	23	1	≥ 1	≥ 1	R#402,AG	[H]
402	553	553	24	24	1	≥ 1	-	PG	[H]
403	277	277	24	24	2	0	-	NE1	[H]
404	185	185	24	24	3	0	-	NE1	[H]
405	139	139	24	24	4	?	-		
406	93	93	24	24	6	0	-	NE1	[H]
407	70	70	24	24	8	≥ 1	-		[51]
408	51	425	25	3	1	$\geq 6 \times 10^{53}$	≥ 9419		[Han,69,105]
409	6	50	25	3	10	19	0	5#4	[49,78]
410	76	475	25	4	1	≥ 32	≥ 1		[Han,23,46]
411	16	100	25	4	5	$\geq 10^{6}$	$\geq 10^{6}$	5#5	[78]
412	101	505	25	5	1	≥ 1	-		[Han]
413	51	255	25	5	2	≥ 1	-		[Han]
414	26	130	25	5	4	≥ 1	-	D#471*	[Han]
415	21	105	25	5	5	$\geq 10^{9}$	-	5#6	[78]
416	11	55	25	5	10	≥ 3337	-	5#7	
417	126	525	25	6	1	≥ 2	≥ 1		[Han,27,82]
418	176	550	25	8	1	?	?		
419	226	565	25	10	1	?	-		
420	76	190	25	10	3	?	-		
421	46	115	25	10	5	≥ 1	-		[96]
422	26	65	25	10	9	≥ 1	-	D#472	[Han]
423	276	575	25	12	1	?	?		
424	26	50	25	13	12	≥ 1	0	R#444,NE3	[K,T]
425	351	585	25	15	1	?	-		
426	51	85	25	15	7	?	-		
427	36	60	25	15	10	≥ 1	-	R#443	[Han]
428	51	75	25	17	8	?	0	R#442*,NE3	[K]
429	76	100	25	19	6	≥ 1	0	R#441,NE3	[H,K]
430	476	595	25	20	1	?	-		
431	96	120	25	20	5	≥ 1	-	R#440	[W]
432	126	150	25	21	4	?	0	R#439*,NE3	[K]
433	176	200	25	22	3	?	0	R#438*,NE3	[K]
434	276	300	25	23	2	?	0	R#437*,NE3	[K]
435	576	600	25	24	1	?	?	R#436*,AG	
436	601	601	25	25	1	?	-	PG	
437	301	301	25	25	2	?	-		
438	201	201	25	25	3	?	-		
439	151	151	25	25	4	0	-	NE1	[H]
440	121	121	25	25	5	≥ 1	-		[W]
441	101	101	25	25	6	≥ 1	-		[H]
442	76	76	25	25	8	0	-	NE1	[H]
443	61	61	25	25	10	≥ 1	-		[W]
444	51	51	25	25	12	≥ 1	-		[T]
445	27	234	26	3	2	$\geq 10^{11}$	≥ 910	2#86,D#511*	

No	v	b	r	k	λ	Nd	Nr	Comments	References
446	40	260	26	4	2	$\geq 10^6$	≥ 1	2#87	
447	14	91	26	4	6	≥ 4	-		[Han,83]
448	105	546	26	5	1	≥ 1	?		[Han]
449	66	286	26	6	2	≥ 1	≥ 1	2#88	[36]
450	27	117	26	6	5	≥ 1	-	D#512*	[Han]
451	14	52	26	7	12	≥ 80	≥ 1	2#89	[H]
452	92	299	26	8	2	?	-		
453	27	78	26	9	8	≥ 120	≥ 3	2#90,D#513	
454	235	611	26	10	1	?	-		
455	40	104	26	10	6	?	?	2#91*	
456	66	156	26	11	4	≥ 494	?	2#92	[58]
457	144	312	26	12	2	?	?	2#93*	
458	313	626	26	13	1	?	-		
459	157	314	26	13	2	?	-	2#94*	
460	105	210	26	13	3	?	-		
461	79	158	26	13	4	≥ 940	-	2#95	[58]
462	53	106	26	13	6	≥ 1	-	2#96*	[W]
463	40	80	26	13	8	≥ 25	-	2#97	
464	27	54	26	13	12	≥ 8	-	2#98,D#514	
465	40	65	26	16	10	≥ 1	-	R#472	[112]
466	105	130	26	21	5	?	0	R#471*,NE3	[K]
467	300	325	26	24	2	0	-	R#470*,NE2	[H]
468	625	650	26	25	1	≥ 33	≥ 33	R#469,AG	[H,63]
469	651	651	26	26	1	≥ 17	-	PG	[H,63]
470	326	326	26	26	2	0	-	NE1	[H]
471	131	131	26	26	5	?	-		
472	66	66	26	26	10	≥ 1	-		[112]
473	55	495	27	3	1	$\geq 6 \times 10^{76}$	-		[Han,69]
474	28	252	27	3	2	$\geq 10^{55}$	-	D#564*	[Han,78]
475	19	171	27	3	3	$\geq 10^{17}$	-	3#29	[78]
476	10	90	27	3	6	$\geq 10^{12}$	-	3#30	[78]
477	7	63	27	3	9	≥ 10	-	9#1	
478	28	189	27	4	3	$\geq 10^{32}$	$\geq 10^{26}$	3#32,D#565*	[78]
479	55	297	27	5	2	≥ 1	?		[Han]
480	10	54	27	5	12	$\geq 10^8$	0	3#33	[78]
481	136	612	27	6	1	≥ 1	-		[87]
482	46	207	27	6	3	$\geq 10^{28}$	-	3#34*	[Han,19]
483	28	126	27	6	5	≥ 2	-	D#566*	[Han,126]
484	16	72	27	6	9	≥ 27	-	3#35	
485	28	108	27	7	6	≥ 5047	?	3#36,D#567	[58]
486	64	216	27	8	3	$\geq 10^{77}$	$\geq 10^{77}$	3#37	[78]
487	217	651	27	9	1	?	-		
488	109	327	27	9	2	≥ 1	-		[45,78]
489	73	219	27	9	3	$\geq 10^{90}$	-	3#38	[78]
490	55	165	27	9	4	?	-		
491	37	111	27	9	6	$\geq 10^{37}$	-	3#39	[78]
492	28	84	27	9	8	≥ 3	-	D#568*	[Han,78,126]
493	25	75	27	9	9	$\geq 10^{28}$	-	3#40	[78]
494	19	57	27	9	12	$\geq 10^{16}$	-	3#41	[78]
495	55	135	27	11	5	?	?		

No	v	b	r	k	λ	Nd	Nr	Comments	References
496	100	225	27	12	3	?	-		
497	28	63	27	12	11	≥2	-	D#569	[101,120,126]
498	325	675	27	13	1	?	?		
499	28	54	27	14	13	$\geq 9 \times 10^{21}$	≥4	R#514,HD	[H,T,66,106]
500	190	342	27	15	2	?	-		
501	55	99	27	15	7	?	-		
502	460	690	27	18	1	?	-		
503	154	231	27	18	3	?	-		
504	52	78	27	18	9	≥2	-	R#513	[W,36]
505	91	117	27	21	6	?	-	R#512*	
506	208	234	27	24	3	?	-	R#511*	
507	325	351	27	25	2	?	0	R#510*,NE3	[K]
508	676	702	27	26	1	?	?	R#509*,AG	
509	703	703	27	27	1	?	-	PG	
510	352	352	27	27	2	?	-		
511	235	235	27	27	3	0	-	NE1	[H]
512	118	118	27	27	6	0	-	NE1	[H]
513	79	79	27	27	9	≥1	-		[30]
514	55	55	27	27	13	≥1	-		[T,20]
515	57	532	28	3	1	$\geq 10^{90}$	≥1		[Han
516	15	140	28	3	4	$\geq 10^{15}$	$\geq 10^{11}$	4#14	[78]
517	9	84	28	3	7	≥330	≥9	7#2	
518	85	595	28	4	1	$\geq 10^{15}$	-		[Han,14]
519	43	301	28	4	2	≥1	-		[Han]
520	29	203	28	4	3	≥1	-	D#586*	[Han]
521	22	154	28	4	4	≥7922	-	2#100	
522	15	105	28	4	6	≥6	-		[Han,71]
523	13	91	28	4	7	$\geq 10^{8}$	-	7#3	[78]
524	8	56	28	4	12	≥2224	31	4#15	[39,49,78]
525	15	84	28	5	8	≥104	?	4#16*,2#102	
526	141	658	28	6	1	?	-		
527	36	168	28	6	4	≥5	≥3	4#17*,2#103	
528	21	98	28	6	7	≥1	-		[Han]
529	16	70	28	6	10	≥118	-	2#104	
530	169	676	28	7	1	≥1	-		[45,78]
531	85	340	28	7	2	≥1	-	2#105*	[119]
532	57	228	28	7	3	≥1	-		[Han]
533	43	172	28	7	4	≥4	-	4#18*,2#106	
534	29	116	28	7	6	≥1	-	2#107,D#587*	
535	25	100	28	7	7	≥1	-		[W]
536	22	88	28	7	8	≥1	-	4#19*,2#108	
537	15	60	28	7	12	$\geq 10^{8}$	-	4#20	[78]
538	50	175	28	8	4	≥1	-		[3]
539	225	700	28	9	1	?	?		
540	85	238	28	10	3	?	-		
541	309	721	28	12	1	?	-		
542	78	182	28	12	4	?	-	2#110*	
543	45	105	28	12	7	≥1	-		[78]
544	169	364	28	13	2	≥765	≥765	2#111	[59]
545	365	730	28	14	1	?	-		

No	v	b	r	k	λ	Nd	Nr	Comments	References
546	183	366	28	14	2	$\geq 10^9$	-	2#112	[61]
547	92	184	28	14	4	?	-	2#113*	
548	53	106	28	14	7	≥ 1	-		[W]
549	29	58	28	14	13	≥ 1	-	D#588	[W]
550	36	63	28	16	12	≥ 2	-	R#569	[101,113]
551	477	742	28	18	1	?	-		
552	57	84	28	19	9	?	0	R#568*,NE3	[K]
553	561	748	28	21	1	?	-		
554	141	188	28	21	4	?	-		
555	81	108	28	21	7	≥ 1	-	R#567	[H]
556	57	76	28	21	10	?	-		
557	99	126	28	22	6	?	-	R#566*	
558	162	189	28	24	4	?	-	R#565*	
559	225	252	28	25	3	?	0	R#564*,NE3	[K]
560	351	378	28	26	2	0	-	R#563*,NE2	[H]
561	729	756	28	27	1	≥ 7	≥ 7	R#562,AG	[H,63]
562	757	757	28	28	1	≥ 3	-	PG	[H,27]
563	379	379	28	28	2	0	-	NE1	[H]
564	253	253	28	28	3	?	-		
565	190	190	28	28	4	0	-	NE1	[H]
566	127	127	28	28	6	?	-		
567	109	109	28	28	7	≥ 1	-		[H]
568	85	85	28	28	9	?	-		
569	64	64	28	28	12	≥ 1	-		[101]
570	30	290	29	3	2	$\geq 2 \times 10^{51}$	≥ 1	D#655*	[Han,44,78]
571	88	638	29	4	1	≥ 2	≥ 1		[Han,14,46]
572	30	174	29	5	4	≥ 1	≥ 4	D#656	[Han,26]
573	30	145	29	6	5	≥ 1	?	D#657*	[Han]
574	175	725	29	7	1	?	?		
575	117	377	29	9	2	≥ 1	?		[45]
576	30	87	29	10	9	?	?	D#658*	
577	117	261	29	13	3	?	?		
578	378	783	29	14	1	?	?		
579	30	58	29	15	14	≥ 1	0	R#588,NE3	[K,W]
580	88	116	29	22	7	?	0	R#587*,NE3	[K]
581	175	203	29	25	4	?	0	R#586*,NE3	[K]
582	378	406	29	27	2	?	0	R#585*,NE3	[K]
583	784	812	29	28	1	?	?	R#584*,AG	
584	813	813	29	29	1	?	-	PG	
585	407	407	29	29	2	?	-		
586	204	204	29	29	4	?	-		
587	117	117	29	29	7	0	-	NE1	[H]
588	59	59	29	29	14	≥ 1	-		[W]
589	61	610	30	3	1	$\geq 2 \times 10^{24}$	-		[Han,69]
590	31	310	30	3	2	$\geq 6 \times 10^{16}$	-	2#114,D#677*	
591	21	210	30	3	3	$\geq 10^{24}$	$\geq 10^{21}$	3#42	[78]
592	16	160	30	3	4	$\geq 10^{13}$	-	2#115	
593	13	130	30	3	5	$\geq 10^8$	-	5#8	[78]
594	11	110	30	3	6	≥ 436801	-	2#116	
595	7	70	30	3	10	≥ 108	-	10#1	

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No	v	b	r	k	λ	Nd	Nr	Comments	References
596	6	60	30	3	12	34	1	6#4,3#43	[49,78]
597	46	345	30	4	2	≥ 1	-		[Han]
598	16	120	30	4	6	$\geq 10^{15}$	$\geq 10^{15}$	6#5	[78]
599	10	75	30	4	10	≥ 29638	-	5#10	[78]
600	121	726	30	5	1	≥ 1	-		[Han]
601	61	366	30	5	2	≥ 11	-	2#120	
602	41	246	30	5	3	$\geq 10^{46}$	-	3#45	
603	31	186	30	5	4	≥ 1	-	2#121,D#678*	
604	25	150	30	5	5	$\geq 10^{17}$	$\geq 10^{17}$	5#11	[78]
605	21	126	30	5	6	$\geq 10^{24}$	-	6#6	[78]
606	16	96	30	5	8	≥ 12	-	2#123	
607	13	78	30	5	10	≥ 31	-	2#124	
608	11	66	30	5	12	$\geq 10^6$	-	6#7	[78]
609	151	755	30	6	1	≥ 1	-		[Han]
610	76	380	30	6	2	≥ 1	-	2#126	
611	51	255	30	6	3	≥ 1	-	3#48*	[Han]
612	31	155	30	6	5	$\geq 10^{23}$	-	5#12,D#679	[78]
613	26	130	30	6	6	≥ 1	-	2#127	
614	16	80	30	6	10	$\geq 10^8$	-	5#13	[78]
615	91	390	30	7	2	≥ 3	?	2#129	
616	21	90	30	7	9	$\geq 10^{18}$	?	3#49	
617	36	135	30	8	6	≥ 3	-	3#50*	[38,126]
618	16	60	30	8	14	$\geq 9 \times 10^7$	≥ 6	2#130	
619	81	270	30	9	3	$\geq 10^{108}$	$\geq 10^{108}$	3#51	[78]
620	21	70	30	9	12	$\geq 10^4$	-	2#131	
621	271	813	30	10	1	?	-		
622	136	408	30	10	2	?	-	2#132*	
623	91	273	30	10	3	$\geq 10^{125}$	-	3#52	[78]
624	55	165	30	10	5	≥ 1	-		[45]
625	46	138	30	10	6	?	-	2#133*,3#53*	
626	31	93	30	10	9	≥ 1	-	3#54,D#680*	
627	28	84	30	10	10	≥ 5	-	2#134*	[Han,78,126]
628	166	415	30	12	2	?	-		
629	56	140	30	12	6	≥ 5	-	2#135	
630	34	85	30	12	10	?	-		
631	91	210	30	13	4	?	?	2#136*	
632	196	420	30	14	2	?	?	2#137*	
633	421	842	30	15	1	?	-		
634	211	422	30	15	2	?	-	2#138*	
635	141	282	30	15	3	?	-		
636	106	212	30	15	4	?	-	2#139*	
637	85	170	30	15	5	?	-		
638	71	142	30	15	6	≥ 9	-	2#140	
639	61	122	30	15	7	≥ 1	-		[W]
640	43	86	30	15	10	≥ 1	-	2#141*	[Han]
641	36	72	30	15	12	$\geq 10^4$	-	2#142	
642	31	62	30	15	14	$\geq 10^6$	-	2#143,D#681	
643	171	285	30	18	3	?	-		
644	286	429	30	20	2	?	-		
645	96	144	30	20	6	?	-		

No	v	b	r	k	λ	Nd	Nr	Comments	References
646	58	87	30	20	10	?	-	R#658*	
647	301	430	30	21	2	?	-		
648	116	145	30	24	6	?	-	R#657*	
649	145	174	30	25	5	≥ 1	-	R#656	[W]
650	261	290	30	27	3	?	-	R#655*	
651	406	435	30	28	2	0	-	R#654*,NE2	[H]
652	841	870	30	29	1	≥ 1	≥ 1	R#653,AG	[H]
653	871	871	30	30	1	≥ 1	-	PG	[H]
654	436	436	30	30	2	0	-	NE1	[H]
655	291	291	30	30	3	?	-		
656	175	175	30	30	5	≥ 2	-		[W,99]
657	146	146	30	30	6	0	-	NE1	[H]
658	88	88	30	30	10	0	-	NE1	[H]
659	63	651	31	3	1	$\geq 10^{42}$	≥ 82160	PG	[H,69,78]
660	32	248	31	4	3	≥ 1	≥ 1	D#729*	[Han,4]
661	125	775	31	5	1	≥ 1	≥ 1	AG	[H]
662	156	806	31	6	1	≥ 1	≥ 1	PG	[H]
663	63	279	31	7	3	≥ 1	?		[Han]
664	32	124	31	8	7	≥ 1	≥ 1	D#730*	[Han,92]
665	63	217	31	9	4	?	?		
666	280	868	31	10	1	?	?		
667	435	899	31	15	1	?	?		
668	32	62	31	16	15	$\geq 10^{28}$	≥ 1	R#681,AG,HD	[H,66]
669	63	93	31	21	10	?	0	R#680*	[27]
670	125	155	31	25	6	$\geq 10^{12}$	$\geq 10^{12}$	R#679,AG	[H,57]
671	156	186	31	26	5	?	0	R#678*,NE3	[K]
672	280	310	31	28	3	?	0	R#677*,NE3	[K]
673	435	465	31	29	2	0	0	R#676*,NE2	[H]
674	900	930	31	30	1	0	0	R#675*,NE2,AG	[H]
675	931	931	31	31	1	0	-	NE1,PG	[H]
676	466	466	31	31	2	0	-	NE1	[H]
677	311	311	31	31	3	?	-		
678	187	187	31	31	5	0	-	NE1	[H]
679	156	156	31	31	6	$\geq 10^{17}$	-	PG	[H,57]
680	94	94	31	31	10	0	-	NE1	[H]
681	63	63	31	31	15	$\geq 10^{17}$	-	PG	[H,57]
682	33	352	32	3	2	$\geq 10^{13}$	≥ 1	2#144,D#775*	
683	9	96	32	3	8	$\geq 10^{7}$	$\geq 10^{5}$	8#2	[78]
684	97	776	32	4	1	≥ 2	-		[14]
685	49	392	32	4	2	≥ 237	-	2#146	
686	33	264	32	4	3	≥ 1	-	D#776*	[Han]
687	25	200	32	4	4	$\geq 10^{22}$	-	4#22	[78]
688	17	136	32	4	6	≥ 1	-	2#148	
689	13	104	32	4	8	$\geq 10^{8}$	-	8#3	[78]
690	9	72	32	4	12	$\geq 10^{6}$	-	4#24	[78]
691	65	416	32	5	2	≥ 3	≥ 1	2#151	
692	81	432	32	6	2	≥ 1	-	2#152*	[Han]
693	33	176	32	6	5	≥ 1	-	D#777*	[Han]
694	21	112	32	6	8	≥ 1	-	4#25*,2#153	
695	49	224	32	7	4	$\geq 10^{52}$	$\geq 10^{52}$	4#26	[78].

No	v	b	r	k	λ	Nd	Nr	Comments	References
696	225	900	32	8	1	?	-		
697	113	452	32	8	2	≥ 1	-	2#155*	[36]
698	57	228	32	8	4	$\geq 10^{63}$	-	4#27	[78]
699	33	132	32	8	7	≥ 1	-	D#778	[Han]
700	29	116	32	8	8	≥ 3	-	4#28*,2#157	
701	17	68	32	8	14	≥ 12	-	2#158	
702	145	464	32	10	2	?	-	2#159*	
703	25	80	32	10	12	≥ 44	-	2#160	
704	33	96	32	11	10	≥ 20	?	2#161,D#779*	
705	177	472	32	12	2	?	-	2#162*	
706	45	120	32	12	8	≥ 1	-	2#163	
707	33	88	32	12	11	≥ 1	-	D#780*	[Han]
708	65	160	32	13	6	?	?	2#164*	
709	105	240	32	14	4	?	-	2#165*	
710	225	480	32	15	2	?	?	2#166*	
711	481	962	32	16	1	?	-		
712	241	482	32	16	2	?	-	2#167*	
713	161	322	32	16	3	?	-		
714	121	242	32	16	4	?	-	2#168*	
715	97	194	32	16	5	?	-		
716	81	162	32	16	6	?	-	2#169*	
717	61	122	32	16	8	≥ 1	-	2#170	
718	49	98	32	16	10	≥ 45	-	2#171	
719	41	82	32	16	12	≥ 3	-	2#172	
720	33	66	32	16	15	≥ 1	-	D#781	[114]
721	305	488	32	20	2	?	-		
722	369	492	32	24	2	?	-		
723	93	124	32	24	8	?	-	R#730*	
724	217	248	32	28	4	?	-	R#729*	
725	465	496	32	30	2	0	-	R#728*,NE2	[H]
726	961	992	32	31	1	≥ 1	≥ 1	R#727,AG	[H]
727	993	993	32	32	1	≥ 1	-	PG	[H]
728	497	497	32	32	2	0	-	NE1	[H]
729	249	249	32	32	4	?	-		
730	125	125	32	32	8	0	-	NE1	[H]
731	67	737	33	3	1	$\geq 10^{35}$	-		[Han,69]
732	34	374	33	3	2	$\geq 10^{41}$	-	D#811*	[Han,78]
733	23	253	33	3	3	$\geq 2 \times 10^{14}$	-		[Han,78]
734	12	132	33	3	6	$\geq 10^{8}$	≥ 1	3#55	[78]
735	7	77	33	3	11	≥ 107	-	11#1	
736	100	825	33	4	1	≥ 2	≥ 1		[Han,14,46]
737	12	99	33	4	9	$\geq 10^{10}$	≥ 1	3#56	
738	45	297	33	5	3	$\geq 10^{54}$	?	3#57	[78]
739	166	913	33	6	1	?	-		
740	56	308	33	6	3	≥ 1	-		[Han]
741	34	187	33	6	5	≥ 1	-	D#812*	[Han]
742	16	88	33	6	11	≥ 1	-		[Han]
743	12	66	33	6	15	≥ 602	≥ 12	3#58	
744	232	957	33	8	1	≥ 1	≥ 1		[28,118]
745	45	165	33	9	6	≥ 35805	?	3#59	[58]

No	v	b	r	k	λ	Nd	Nr	Comments	References
746	100	330	33	10	3	?	?	3#60*	
747	331	993	33	11	1	?	-		
748	166	498	33	11	2	?	-		
749	111	333	33	11	3	?	-	3#61*	
750	67	201	33	11	5	≥ 1	-		[W]
751	56	168	33	11	6	$\geq 10^{71}$	-	3#62	[78]
752	34	102	33	11	10	≥ 1	-	D#813*	[Han]
753	31	93	33	11	11	≥ 1	-		[Han]
754	23	69	33	11	15	≥ 1103	-	3#63	
755	364	1001	33	12	1	?	-		
756	155	341	33	15	3	?	-		
757	496	1023	33	16	1	≥ 1	≥ 1		[100]
758	34	66	33	17	16	≥ 1	0	R#781,NE3	[K,114]
759	133	209	33	21	5	?	-		
760	56	88	33	21	12	?	-	R#780*	
761	694	1041	33	22	1	?	-		
762	232	348	33	22	3	?	-		
763	100	150	33	22	7	?	-		
764	78	117	33	22	9	?	-		
765	64	96	33	22	11	?	-	R#779*	
766	760	1045	33	24	1	?	-		
767	100	132	33	25	8	≥ 1	0	R#778,NE3	[K,43]
768	144	176	33	27	6	?	-	R#777*	
769	232	264	33	29	4	?	0	R#776*,NE3	[K]
770	320	352	33	30	3	?	-	R#775*	
771	496	528	33	31	2	?	0	R#774*,NE3	[K]
772	1024	1056	33	32	1	≥ 11	≥ 11	R#773,AG	[H,27]
773	1057	1057	33	33	1	≥ 6	-	PG	[H,27]
774	529	529	33	33	2	?	-		
775	353	353	33	33	3	0	-	NE1	[H]
776	265	265	33	33	4	?	-		
777	177	177	33	33	6	?	-		
778	133	133	33	33	8	≥ 1	-		[43]
779	97	97	33	33	11	?	-		
780	89	89	33	33	12	0	-	NE1	[H]
781	67	67	33	33	16	≥ 1	-		[114]
782	69	782	34	3	1	$\geq 4\times 10^{41}$	≥ 1		[Han,46,69]
783	18	204	34	3	4	$\geq 4\times 10^{14}$	≥ 1	2#173	
784	52	442	34	4	2	≥ 207	≥ 1	2#174	
785	18	153	34	4	6	≥ 1	-		[Han]
786	35	238	34	5	4	≥ 1	?	2#175,D#869*	
787	171	969	34	6	1	?	-		
788	18	102	34	6	10	≥ 4	≥ 3	2#176	
789	35	170	34	7	6	≥ 2	?	2#177,D#870*	
790	120	510	34	8	2	≥ 1	≥ 1	2#178	
791	18	68	34	9	16	$\geq 10^{3}$	≥ 1	2#179	[H]
792	35	119	34	10	9	≥ 1	-	D#871*	[Han]
793	341	1054	34	11	1	?	?		
794	52	136	34	13	8	≥ 1	?	2#180	
795	35	85	34	14	13	?	-	D#872*	

No	v	b	r	k	λ	Nd	Nr	Comments	References
796	120	272	34	15	4	?	?	2#181*	
797	256	544	34	16	2	≥477603	≥477603	2#182	[59]
798	545	1090	34	17	1	?	-		
799	273	546	34	17	2	$\geq 10^{12}$	-	2#183	[61]
800	137	274	34	17	4	?	-	2#184*	
801	69	138	34	17	8	≥1	-	2#185	
802	35	70	34	17	16	≥1854	-	2#186,D#873	
803	715	1105	34	22	1	?	-		
804	69	102	34	23	11	?	0	R#813*,NE3	[K]
805	154	187	34	28	6	?	-	R#812*	
806	341	374	34	31	3	?	0	R#811*,NE3	[K]
807	528	561	34	32	2	0	-	R#810*,NE2	[H]
808	1089	1122	34	33	1	0	0	R#809*,NE2,AG	[H]
809	1123	1123	34	34	1	0	-	NE1	[H]
810	562	562	34	34	2	0	-	NE1	[H]
811	375	375	34	34	3	?	-		
812	188	188	34	34	6	0	-	NE1	[H]
813	103	103	34	34	11	?	-		
814	36	420	35	3	2	$\geq 2 \times 10^{50}$	≥1	D#961*	[Han,44,78]
815	15	175	35	3	5	$\geq 10^{15}$	$\geq 10^{11}$	5#14	[78]
816	6	70	35	3	14	48	0	7#4	[49,78]
817	36	315	35	4	3	≥1	≥1	D#962*	[Han,4]
818	16	140	35	4	7	$\geq 10^{15}$	$\geq 10^{15}$	7#5	[78]
819	8	70	35	4	15	≥2224	≥5	5#15	
820	141	987	35	5	1	≥1	-		[Han]
821	71	497	35	5	2	≥1	-		[Han]
822	36	252	35	5	4	≥2	-	D#963*	[Han,126]
823	29	203	35	5	5	≥1	-		[Han]
824	21	147	35	5	7	$\geq 10^{24}$	-	7#6	[78]
825	15	105	35	5	10	≥1	?	5#16*	[Han]
826	11	77	35	5	14	$\geq 10^{6}$	-	7#7	[78]
827	36	210	35	6	5	≥1	≥1	5#17*,D#964*	[Han,4]
828	211	1055	35	7	1	?	-		
829	106	530	35	7	2	?	-		
830	71	355	35	7	3	≥1	-		[W]
831	43	215	35	7	5	≥1	-	5#18*	[Han]
832	36	180	35	7	6	≥1	-	D#965*	[Han]
833	31	155	35	7	7	≥5	-	PG	[H,108]
834	22	110	35	7	10	≥1	-	5#19*	[Han]
835	16	80	35	7	14	≥1	-		[Han]
836	15	75	35	7	15	$\geq 10^{9}$	-	5#20	[78]
837	36	140	35	9	8	≥2	?	D#966*	[Han,126]
838	316	1106	35	10	1	?	-		
839	106	371	35	10	3	?	-		
840	64	224	35	10	5	?	-		
841	46	161	35	10	7	?	-		
842	36	126	35	10	9	≥2	-	D#967*	[Han,126]
843	22	77	35	10	15	≥1	-		[Han]
844	176	560	35	11	2	?	?		
845	36	105	35	12	11	≥1	≥1	D#968*	[Han,81]

No	v	b	r	k	λ	Nd	Nr	Comments	References
846	456	1140	35	14	1	?	-		
847	92	230	35	14	5	?	-		
848	66	165	35	14	7	?	-		
849	36	90	35	14	13	≥ 1	-	D#969*	[Han]
850	246	574	35	15	2	?	-		
851	99	231	35	15	5	?	-		
852	36	84	35	15	14	≥ 1	-	D#970*	[Han]
853	176	385	35	16	3	?	?		
854	561	1155	35	17	1	?	?		
855	36	70	35	18	17	≥ 91	≥ 91	R#873,HD	[18,114]
856	96	168	35	20	7	?	-		
857	351	585	35	21	2	?	-		
858	141	235	35	21	5	?	-		
859	51	85	35	21	14	?	-	R#872*	
860	85	119	35	25	10	?	-	R#871*	
861	316	395	35	28	3	?	-		
862	136	170	35	28	7	?	-	R#870*	
863	64	80	35	28	15	?	-		
864	204	238	35	30	5	?	-	R#869*	
865	561	595	35	33	2	0	0	R#868*,NE2	[H]
866	1156	1190	35	34	1	?	?	R#867*,AG	
867	1191	1191	35	35	1	?	-	PG	
868	596	596	35	35	2	0	-	NE1	[H]
869	239	239	35	35	5	?	-		
870	171	171	35	35	7	?	-		
871	120	120	35	35	10	?	-		
872	86	86	35	35	14	0	-	NE1	[H]
873	71	71	35	35	17	≥ 1	-		[114]
874	73	876	36	3	1	$\geq 10^{34}$	-		[Han,69]
875	37	444	36	3	2	$\geq 10^{10}$	-	2#187,D#991*	
876	25	300	36	3	3	$\geq 10^{25}$	-	3#64	[78]
877	19	228	36	3	4	$\geq 10^{17}$	-	4#29	[78]
878	13	156	36	3	6	$\geq 10^{17}$	-	6#8	[78]
879	10	120	36	3	8	$\geq 10^{12}$	-	4#30	[78]
880	9	108	36	3	9	≥ 330	≥ 10	9#2	
881	7	84	36	3	12	≥ 417	-	12#1	
882	109	981	36	4	1	≥ 2	-		[14]
883	55	495	36	4	2	≥ 1	-		[Han]
884	37	333	36	4	3	$\geq 10^{40}$	-	3#68,D#992*	[78]
885	28	252	36	4	4	$\geq 10^{32}$	$\geq 10^{26}$	4#32	[78]
886	19	171	36	4	6	$\geq 10^{20}$	-	3#69	
887	13	117	36	4	9	$\geq 10^{8}$	-	9#3	[78]
888	10	90	36	4	12	$\geq 10^{9}$	-	6#10	[78]
889	145	1044	36	5	1	≥ 1	?		[Han]
890	25	180	36	5	6	$\geq 10^{38}$	$\geq 10^{38}$	6#11	[78]
891	10	72	36	5	16	$\geq 10^{8}$	≥ 1	4#33,2#195	[78]
892	181	1086	36	6	1	≥ 1	-		[Han]
893	91	546	36	6	2	≥ 5	-	2#196	
894	61	366	36	6	3	≥ 1	-	3#73*	[Han]
895	46	276	36	6	4	≥ 1	-	4#34*,2#197	

No	v	b	r	k	λ	Nd	Nr	Comments	References
896	37	222	36	6	5	≥ 1	-	D#993	[Han]
897	31	186	36	6	6	$\geq 10^{51}$	-	6#12	[78]
898	21	126	36	6	9	≥ 1	-	3#75	
899	19	114	36	6	10	≥ 1	-	2#199	
900	16	96	36	6	12	$\geq 10^{19}$	-	6#13	[78]
901	13	78	36	6	15	$\geq 10^{11}$	-	3#77	[78]
902	217	1116	36	7	1	≥ 1	?		[72]
903	28	144	36	7	8	≥ 5432	?	4#36	[58]
904	64	288	36	8	4	$\geq 10^{77}$	$\geq 10^{77}$	4#37	[78]
905	22	99	36	8	12	≥ 1	-	3#78*	[Han]
906	289	1156	36	9	1	?	-		
907	145	580	36	9	2	≥ 1	-	2#203*	[119]
908	97	388	36	9	3	?	-		
909	73	292	36	9	4	$\geq 10^{90}$	-	4#38	[78]
910	49	196	36	9	6	≥ 1	-	2#205*	[45,78]
911	37	148	36	9	8	$\geq 10^{37}$	-	4#39,D#994*	[78]
912	33	132	36	9	9	$\geq 10^{39}$	-	3#79	
913	25	100	36	9	12	$\geq 10^{28}$	-	4#40	
914	19	76	36	9	16	$\geq 10^{16}$	-	4#41	[78]
915	325	1170	36	10	1	?	-		
916	55	198	36	10	6	?	-	3#80*,2#209*	
917	121	396	36	11	3	$\geq 10^{188}$	$\geq 10^{188}$	3#81	[78]
918	397	1191	36	12	1	?	-		
919	199	597	36	12	2	?	-		
920	133	399	36	12	3	$\geq 10^{208}$	-	3#82	[78]
921	100	300	36	12	4	?	-	2#210*	
922	67	201	36	12	6	≥ 1	-	3#83*	[W]
923	45	135	36	12	9	$\geq 10^{57}$	-	3#84	
924	37	111	36	12	11	≥ 1	-	D#995*	[Han]
925	34	102	36	12	12	≥ 2	-	3#85*,2#211	
926	469	1206	36	14	1	?	-		
927	505	1212	36	15	1	?	-		
928	85	204	36	15	6	?	-	2#212*	
929	136	306	36	16	4	?	-	2#213*	
930	289	612	36	17	2	≥ 3481	≥ 3481	2#214	[59]
931	613	1226	36	18	1	?	-		
932	307	614	36	18	2	$\geq 8 \times 10^{13}$	-	2#215	[61]
933	205	410	36	18	3	?	-		
934	154	308	36	18	4	?	-	2#216*	
935	103	206	36	18	6	?	-	2#217*	
936	69	138	36	18	9	?	-		
937	52	104	36	18	12	?	-	2#218*	
938	37	74	36	18	17	≥ 1	-	D#996	[Han]
939	685	1233	36	20	1	?	-		
940	115	207	36	20	6	?	-		
941	721	1236	36	21	1	?	-		
942	91	156	36	21	8	?	-		
943	49	84	36	21	15	?	-	R#970*	
944	253	414	36	22	3	?	-		
945	55	90	36	22	14	?	-	R#969*	

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No	v	b	r	k	λ	Nd	Nr	Comments	References
946	208	312	36	24	4	?	-		
947	70	105	36	24	12	?	-	R#968*	
948	91	126	36	26	10	?	-	R#967*	
949	105	140	36	27	9	?	-	R#966*	
950	973	1251	36	28	1	?	-		
951	145	180	36	29	7	?	0	R#965*,NE3	[K]
952	1045	1254	36	30	7	?	-		
953	175	210	36	30	6	?	0	R#964*	
954	217	252	36	31	5	?	-	R#963*,NE3	[K]
955	280	315	36	32	4	?	-	R#962*	
956	385	420	36	33	3	?	-	R#961*	
957	595	630	36	34	2	?	-	R#960*	
958	1225	1260	36	35	1	?	?	R#959*,AG	
959	1261	1261	36	36	1	?	?	PG	
960	631	631	36	36	2	?	-		
961	421	421	36	36	3	?	-		
962	316	316	36	36	4	0	-	NE1	[H]
963	253	253	36	36	5	?	-		
964	211	211	36	36	6	0	-	NE1	[H]
965	181	181	36	36	7	?	-		
966	141	141	36	36	9	?	-		
967	127	127	36	36	10	0	-	NE1	[H]
968	106	106	36	36	12	0	-	NE1	[H]
969	91	91	36	36	14	?	-		
970	85	85	36	36	15	$\geq 10^{196}$	-		
971	75	925	37	3	1	≥ 2	≥ 1		[Han,43,49]
972	112	1036	37	4	1	≥ 1	≥ 1		[Han,13,43]
973	75	555	37	5	2	≥ 1	?		[Han]
974	186	1147	37	6	1	≥ 1	≥ 1		[Han,36]
975	112	592	37	7	2	?	?		[Han]
976	297	1221	37	9	1	?	?		
977	408	1258	37	12	1	≥ 1	≥ 1		
978	75	185	37	15	7	?	?		[92]
979	112	259	37	16	5	?	?		
980	630	1295	37	18	1	≥ 1	0	R#996,NE3	[K,114]
981	38	74	37	19	18	?	0	R#995*,NE3	[K]
982	75	111	37	25	12	?	?	R#994*	
983	112	148	37	28	9	≥ 1	0	R#993,NE3	[K,95]
984	186	222	37	31	6	?	0	R#992*,NE3	[K]
985	297	333	37	33	4	?	0	R#991*,NE3	[K]
986	408	444	37	34	3	0	0	R#990*,NE2	[H]
987	630	666	37	35	2	?	?	R#989*,AG	
988	1296	1332	37	36	1	?	-		
989	1333	1333	37	37	1	?	-	PG	
990	667	667	37	37	2	0	-	NE1	[H]
991	445	445	37	37	3	0	-	NE1	[H]
992	334	334	37	37	4	0	-	NE1	[H]
993	223	223	37	37	6	?	-		[95]
994	149	149	37	37	9	?	-		
995	112	112	37	37	12	?	-		

No	v	b	r	k	λ	Nd	Nr	Comments	References
996	75	75	37	37	18	≥ 1	-		[98]
997	39	494	38	3	2	$\geq 10^{44}$	≥ 89	2#219,D#1071*	
998	58	551	38	4	2	≥ 1	-		[Han]
999	20	190	38	4	6	≥ 1	≥ 4	2#220	
1000	20	152	38	5	8	≥ 1	≥ 3	2#221	
1001	96	608	38	6	2	≥ 1	≥ 1	2#222	[36]
1002	39	247	38	6	5	≥ 1	-	D#1072*	[Han]
1003	77	418	38	7	3	≥ 1	?		[Han]
1004	20	95	38	8	14	≥ 1	-		[Han]
1005	153	646	38	9	2	≥ 1	?	2#223*	[45,78]
1006	115	437	38	10	3	?	-		
1007	20	76	38	10	18	$\geq 10^{16}$	≥ 4	2#224	
1008	77	266	38	11	5	?	?		
1009	210	665	38	12	2	?	-		
1010	39	114	38	13	12	≥ 1	?	2#225*,D#1073*	[Han]
1011	96	228	38	16	6	?	?	2#226*	
1012	153	342	38	17	4	?	?	2#227*	
1013	324	684	38	18	2	?	?	2#228*	
1014	685	1370	38	19	1	?	-		
1015	343	686	38	19	2	?	-	2#229*	
1016	229	458	38	19	3	?	-		
1017	172	344	38	19	4	?	-	2#230*	
1018	115	230	38	19	6	?	-	2#231*	
1019	77	154	38	19	9	?	-		
1020	58	116	38	19	12	?	-	2#232*	
1021	39	78	38	19	18	≥ 39	-	2#233,D#1074	
1022	666	703	38	36	2	?	-	R#1025*	
1023	1369	1406	38	37	1	≥ 1	≥ 1	R#1024,AG	[H]
1024	1407	1407	38	38	1	≥ 1	-	PG	[H]
1025	704	704	38	38	2	?	-		
1026	79	1027	39	3	1	$\geq 10^{56}$	-		[Han,69]
1027	40	520	39	3	2	$\geq 6 \times 10^{24}$	-	D#1163*	[Han,78]
1028	27	351	39	3	3	$\geq 10^{28}$	$\geq 10^{30}$	3#86	[78]
1029	14	182	39	3	6	$\geq 2 \times 10^{34}$	-		[Han,78]
1030	7	91	39	3	13	≥ 417	-	13#1	
1031	40	390	39	4	3	$\geq 10^{33}$	$\geq 10^{33}$	3#87,D#1164*	[78]
1032	40	312	39	5	4	≥ 1	?	D#1165*	[Han]
1033	196	1274	39	6	1	?	-		
1034	66	429	39	6	3	≥ 1	≥ 1	3#88	[98]
1035	40	260	39	6	5	≥ 1	-	D#1166*	[Han]
1036	16	104	39	6	13	≥ 1	-		[Han]
1037	14	91	39	6	15	≥ 1	-		[Han]
1038	14	78	39	7	18	$\geq 10^{11}$	0	3#89	[78]
1039	40	195	39	8	7	≥ 1	?	D#1167*	[Han]
1040	105	455	39	9	3	?	-		
1041	27	117	39	9	12	$\geq 10^{17}$	$\geq 10^{17}$	3#90	[78]
1042	40	156	39	10	9	≥ 1	?	3#91*,D#1168*	[Han]
1043	66	234	39	11	6	≥ 21584	?	3#92	[58]
1044	144	468	39	12	3	?	?	3#93*	
1045	40	130	39	12	11	≥ 1	-	D#1169*	[Han]

No	v	b	r	k	λ	Nd	Nr	Comments	References
1046	469	1407	39	13	1	?	-		
1047	235	705	39	13	2	?	-		
1048	157	471	39	13	3	?	-	3#94*	
1049	118	354	39	13	4	?	-		
1050	79	237	39	13	6	$\geq 10^{125}$	-	3#95	[78]
1051	53	159	39	13	9	?	-	3#96*	
1052	40	120	39	13	12	$\geq 10^{33}$	-	3#97,D#1170	[78]
1053	37	111	39	13	13	≥ 1	-		[Han]
1054	27	81	39	13	18	≥ 8	-	3#98	
1055	40	104	39	15	14	≥ 1	-	D#1171*	[Han]
1056	222	481	39	18	3	?	-		
1057	703	1443	39	19	1	?	?		
1058	40	78	39	20	19	≥ 1	≥ 1	R#1074,HD	[114]
1059	196	364	39	21	4	?	-		
1060	976	1464	39	26	1	?	-		
1061	326	489	39	26	3	?	-		
1062	196	294	39	26	5	?	-		
1063	76	114	39	26	13	?	-	R#1073*	
1064	66	99	39	26	15	?	-		
1065	209	247	39	33	6	?	-	R#1072*	
1066	456	494	39	36	3	?	-	R#1071*	
1067	703	741	39	37	2	0	0	R#1070*,NE2	[H]
1068	1444	1482	39	38	1	0	0	R#1069*,NE2,AG	[H]
1069	1483	1483	39	39	1	0	-	NE1,PG	[H]
1070	742	742	39	39	2	0	-	NE1	[H]
1071	495	495	39	39	3	?	-		
1072	248	248	39	39	6	0	-	NE1	[H]
1073	115	115	39	39	13	0	-	NE1	[H]
1074	79	79	39	39	19	≥ 1	-		[98]
1075	81	1080	40	3	1	$\geq 10^{48}$	$\geq 10^{7}$	AG	[H,69,78]
1076	21	280	40	3	4	$\geq 10^{24}$	$\geq 10^{21}$	4#42	[78]
1077	9	120	40	3	10	$\geq 10^{8}$	$\geq 10^{5}$	10#2	[78]
1078	6	80	40	3	16	76	1	8#4,4#43	[78]
1079	121	1210	40	4	1	$\geq 10^{6}$	-		[14,16]
1080	61	610	40	4	2	$\geq 10^{4}$	-	2#237	
1081	41	410	40	4	3	≥ 1	-	D#1192*	
1082	31	310	40	4	4	≥ 1	-	2#238	
1083	25	250	40	4	5	$\geq 10^{23}$	-	5#22	[78]
1084	21	210	40	4	6	≥ 1	-	2#239	
1085	16	160	40	4	8	$\geq 10^{15}$	≥ 1	8#5	[78]
1086	13	130	40	4	10	$\geq 10^{14}$	-	10#3	[78]
1087	11	110	40	4	12	≥ 1	-	2#242	
1088	9	90	40	4	15	$\geq 10^{6}$	-	5#24	[78]
1089	161	1288	40	5	1	≥ 1	-		[Han]
1090	81	648	40	5	2	≥ 1	-	2#243	
1091	41	328	40	5	4	$\geq 10^{46}$	-	4#45,D#1193*	
1092	33	264	40	5	5	≥ 1	-		[Han]
1093	21	168	40	5	8	$\geq 10^{24}$	-	8#6	[78]
1094	17	136	40	5	10	≥ 1	-	2#246	
1095	11	88	40	5	16	$\geq 10^{7}$	-	8#7	[78]

No	v	b	r	k	λ	Nd	Nr	Comments	References
1096	201	1340	40	6	1	?	-		
1097	51	340	40	6	4	≥ 1	-	4#48*,2#248	
1098	21	140	40	6	10	≥ 1	-	5#25*,2#249	
1099	49	280	40	7	5	$\geq 10^{53}$	$\geq 10^{53}$	5#26	[78]
1100	21	120	40	7	12	$\geq 10^{18}$	?	4#49	
1101	281	1405	40	8	1	?	-		
1102	141	705	40	8	2	?	-		
1103	71	355	40	8	4	≥ 1	-		[W]
1104	57	285	40	8	5	$\geq 10^{63}$	-	5#27	[78]
1105	41	205	40	8	7	≥ 1	-	D#1194*	[Han]
1106	36	180	40	8	8	≥ 1	-	4#50*,2#251	
1107	29	145	40	8	10	≥ 1	-	5#28*	[Han]
1108	21	105	40	8	14	?	-		
1109	81	360	40	9	4	$\geq 10^{108}$	$\geq 10^{108}$	4#51	[78]
1110	361	1444	40	10	1	?	-		
1111	181	724	40	10	2	≥ 1	-	2#253*	[119]
1112	121	484	40	10	3	?	-		
1113	91	364	40	10	4	$\geq 10^{125}$	-	4#52	[78]
1114	73	292	40	10	5	≥ 1	-		[W]
1115	61	244	40	10	6	≥ 10	-	2#255*	[10]
1116	46	184	40	10	8	?	-	4#53*,2#256*	
1117	41	164	40	10	9	≥ 1	-	D#1195*	[Han]
1118	37	148	40	10	10	≥ 1	-	2#257	
1119	31	124	40	10	12	≥ 1	-	4#54	
1120	25	100	40	10	15	≥ 1	-		[Han]
1121	21	84	40	10	18	≥ 5	-	2#259	
1122	441	1470	40	12	1	?	-		
1123	111	370	40	12	4	?	-	2#260*	
1124	45	150	40	12	10	?	-	2#261*	
1125	481	1480	40	13	1	?	?		
1126	105	300	40	14	5	?	-		
1127	561	1496	40	15	1	?	-		
1128	141	376	40	15	4	?	-	2#262*	
1129	81	216	40	15	7	≥ 1	-		[W]
1130	57	152	40	15	10	?	-	2#263*	
1131	36	96	40	15	16	≥ 1	-	2#264	
1132	76	190	40	16	8	≥ 1	-	2#265	
1133	171	380	40	18	4	?	-	2#266*	
1134	361	760	40	19	2	≥ 7417	≥ 7417	2#267	[59]
1135	761	1522	40	20	1	?	-		
1136	381	762	40	20	2	$\geq 3 \times 10^{16}$	-	2#268	[61]
1137	191	382	40	20	4	?	-	2#269*	
1138	153	306	40	20	5	?	-		
1139	96	192	40	20	8	≥ 3	-	2#270	
1140	77	154	40	20	10	?	-	2#271*	
1141	41	82	40	20	19	≥ 1	-	D#1196	[114]
1142	121	220	40	22	7	?	-		
1143	921	1535	40	24	1	?	-		
1144	231	385	40	24	4	?	-		
1145	93	155	40	24	10	?	-		

No	v	b	r	k	λ	Nd	Nr	Comments	References
1146	65	104	40	25	15	?	-	R#1171*	
1147	1001	1540	40	26	1	?	-		
1148	81	120	40	27	13	$\geq 10^{13}$	$\geq 10^{13}$	R#1170,AG	[H,57]
1149	217	310	40	28	5	?	-		
1150	91	130	40	28	12	?	-	R#1169*	
1151	1161	1548	40	30	1	?	-		
1152	291	388	40	30	4	?	-		
1153	117	156	40	30	10	?	-	R#1168*	
1154	156	195	40	32	8	?	-	R#1167*	
1155	221	260	40	34	6	?	-	R#1166*	
1156	273	312	40	35	5	?	-	R#1165*	
1157	351	390	40	36	4	?	-	R#1164*	
1158	481	520	40	37	3	?	0	R#1163*,NE3	[K]
1159	741	780	40	38	2	0	-	R#1162*,NE2	[H]
1160	1521	1560	40	39	1	?	?	R#1161*,AG	
1161	1561	1561	40	40	1	?	-	PG	
1162	781	781	40	40	2	0	-	NE1	[H]
1163	521	521	40	40	3	?	-		
1164	391	391	40	40	4	?	-		
1165	313	313	40	40	5	0	-	NE1	[H]
1166	261	261	40	40	6	0	-	NE1	[H]
1167	196	196	40	40	8	0	-	NE1	[H]
1168	157	157	40	40	10	0	-	NE1	[H]
1169	131	131	40	40	12	?	-		
1170	121	121	40	40	13	$\geq 10^{29}$	-	PG	[H,57]
1171	105	105	40	40	15	?	-		
1172	42	574	41	3	2	$\geq 6 \times 10^{24}$	≥ 1	D	[Han,44,78]
1173	124	1271	41	4	1	≥ 2	≥ 1		[Han,14,46]
1174	165	1353	41	5	1	≥ 1	?		[Han]
1175	42	287	41	6	5	≥ 1	?	D	[Han]
1176	42	246	41	7	6	≥ 1	?	D	[Han]
1177	288	1476	41	8	1	≥ 1	≥ 1		[3,37]
1178	370	1517	41	10	1	?	?		
1179	247	779	41	13	2	?	?		
1180	42	123	41	14	13	?	?	D	
1181	247	533	41	19	3	?	?		
1182	780	1599	41	20	1	?	?		
1183	42	82	41	21	20	≥ 1	0	R#1196,NE3	[K,114]
1184	124	164	41	31	10	?	0	R#1195*,NE3	[K]
1185	165	205	41	33	8	?	0	R#1194*,NE3	[K]
1186	288	328	41	36	5	?	0	R#1193*,NE3	[K]
1187	370	410	41	37	4	?	0	R#1192*,NE3	[K]
1188	780	820	41	39	2	?	0	R#1191*,NE3	[K]
1189	1600	1640	41	40	1	?	?	R#1190*,AG	
1190	1641	1641	41	41	1	?	-	PG	
1191	821	821	41	41	2	?	-		
1192	411	411	41	41	4	?	-		
1193	329	329	41	41	5	?	-		
1194	206	206	41	41	8	0	-	NE1	[H]
1195	165	165	41	41	10	?	-		
1196	83	83	41	41	20	≥ 1	-		[114]

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