

NUMERICAL TABLES
ON
ELLIPTIC CURVES

SOURCES AND RELIABILITY OF THE TABLES.

1. Tables 2-6.

Table 2 has been prepared for this volume by N.M. Stephens and James Davenport using the ATLAS at the Chilton laboratory. No errors are likely, but it is possible that in one or two cases a multiple of a generator has been listed rather than a generator.

Table 3 was prepared by J. Vélu; except for the eigenvalues of the W_q , the calculations have been performed independently by Stephens and Vélu, and no discrepancy has been observed; there are also strong requirements of consistency. The W_q -eigenvalues were calculated separately by D.J. Tingley, by operating on the one-dimensional homology; his results were incorporated in Vélu's tables by reading in cards. Consistency requirements make any errors in these particular calculations of Tingley hardly conceivable; copying errors are possible but unlikely. The identifying letters of the curves in this table have been added in manuscript; I hope they have never been jumbled.

Table 4 has been extracted from the unpublished 1966 Manchester thesis of F.B. Coghlan. Unless some mathematical error has remained undetected, the table should be complete.

The third column of Table 5 comes from a much larger table supplied by A.O.L. Atkin; the final column was supplied by D.J. Tingley, who has completely computed the action of the Hecke algebra on the 1-dimensional homology for $N \leq 300$. His complete tables of eigenvalues will be published elsewhere. Table 6, too, is copied from a table of Atkin's; this table is new, note that the much shorter table of Deuring contains errors. Tables 5 and 6 were produced by typewriter rather than line-printer; it was very difficult to avoid slips.

2. Table 1.

The origins of Table 1 are more complicated. To begin with, Swinnerton-Dyer ran a search program which searched through all curves $y^2 + a_1xy + a_3y = x^3 + a_2x^2 + a_4x + a_6$ with $|a_1|, |a_2|, |a_3| \leq 1$, and $|a_4|, |a_6|$ not too large, and by using Tate's algorithm picked out those with conductor less than 500. In a second run, he found all curves isogenous by a succession of 2- or 3-isogenies to any of these. For this "first list", $a_1, \dots, a_6, c_4, c_6, \Delta$ and the conductor N were tabulated; the calculation was apparently free of errors, in the sense that every curve in the output really did have the conductor asserted, but the search region was certainly not large enough to find representatives of each isomorphism class, or even of each isogeny class, of elliptic curves with conductor less than 100. This first list has been quite widely circulated, but a number of curves are missing, and some isogenies were missed too.

In preparing the present table, we started with the "first list". By checking numbers of points modulo p , we have made sure that no isogenies between listed curves have been missed; we have also added a number of curves which are 5- or 7-isogenous to listed curves (Vélu provided most of these, and also curves with conductor 11 or 121 which had been missed by the search). We believe that our tables are now "complete under isogeny" in the sense that they contain all curves isogenous to listed curves; Vélu has in fact checked this, using a program based on Serre [Inventiones 15 (1972)].

We know that to every rational eigendifferential of the Hecke algebra that is a newform on $H/\Gamma_0(N)$ there corresponds an isogeny class of elliptic curves; it is generally supposed that it has conductor N , and Weil's conjecture asserts that all elliptic curves over $\mathbb{Q}$ arise this way. For $N \leq 300$, Tingley's calculation of the action of the Hecke algebra on the 1-dimensional homology has given the complete splitting of

the space of differentials. Tingley's calculations confirmed that we had never found too many classes of curves with a given conductor; but in 30 cases with $N \leq 200$, an isogeny class had been missed. In 10 of these cases, the gap was filled by twisting a listed curve; and in about 10 more, the gap was filled by extending Swinnerton-Dyer's search. In the remaining cases, the gap was filled by working backwards (to a greater or lesser extent) from Tingley's eigenvalues. Subsequently, Tingley went further and wrote a program to integrate the eigendifferentials round the eigencycles; he thus obtained the equations of the "strong Weil curves" directly from $H/\Gamma_0(N)$. The curves he obtained were those which are circled in the pictures of Table 1. (More precisely, the equations obtained by Tingley had the same coefficients to several decimal places !)

Note that it is not correct to assert that Table 1 "verifies Weil's conjecture for $N \leq 200$ "; the table is consistent with Weil's conjecture, of course, but our search region was not really very large - we could well have missed curves not parametrised by modular functions, if there are any and their coefficients are not small. Between them, Agrawal, Akhtar Coghlan and Setzer have proved in their theses that Table 1 is complete for conductors of the form $2^a 3^b$; that it is complete for $N = 17, 19, 49, 73$ and 113 ; and that there are no curves of prime conductor $p < 200$ when none are listed, with the possible exceptions of $p = 107, 173, 179$ and 181 .

It is rather easy to make an error in the computation of Kodaira symbols; however, in most cases they were calculated independently by Stephens and Vélú, so errors are unlikely. The same applies to the number of points of finite order, though here fewer checks have been made. The isogenies were checked mainly by Vélú, by the methods of Serre; no error is likely. The rank of the Mordell-Weil group was calculated by James Davenport, by the method of Birch and Swinnerton-Dyer; in a few cases, marked with queries, the method failed as the large coefficients of the relevant forms forced too large a search region.

REMARKS ON ISOGENIES.

An examination of Table 1 might suggest that an elliptic curve over Q is usually isogenous to several others, and that isogenies of fairly high degree are not uncommon. This is not so - the elliptic curves of low conductor are not at all typical, they have many more interesting properties than they deserve. The tables in fact illustrate almost all the known ways in which isogenies can occur; they miss the 17- and the 37- isogeny, and they also miss the examples of complex multiplication by $\frac{1}{2}(1+\sqrt{-D})$ for $D = 19, 43, 67$ and 163 .

An N -isogeny of E to F is a rational map of E to F , defined over Q , which is a group homomorphism with kernel a cyclic subgroup of E of order N ; and from any cyclic subgroup of E of order N defined over Q we can construct an N -isogeny. From a computational point of view, this has been done very explicitly by Vélú [Comptes Rendus 273]. To any isogeny class of curves, there corresponds an integer N , such that each pair of curves in the class are connected by an isogeny of degree dividing N ; and then, in the absence of complex multiplication, the picture in the right hand column of Table 1 is completely determined by N . If two curves E, F are N -isogenous, and k is any non-zero integer, then the twists E^*k, F^*k are N -isogenous too.

Suppose now that E is an elliptic curve over Q with j -invariant $j(E)$. There is another elliptic curve N -isogenous to E over Q if and only if we can find z in the upper half-plane so that $j(E) = j(z)$ and $j(z), j(Nz)$ are both rational; so looking for rational N -isogenies is essentially equivalent to finding rational points other than cusps on $H/\Gamma_0(N)$, the curve whose generic point is $(j(z), j(Nz))$. Recollect that a typical curve with invariant j is

$$Ay^2 = 4x^3 - [j/(j-1728)](3x+1). \quad (1)$$

If $H/\Gamma_0(N)$ has genus zero, then it has infinitely many rational points, so there are infinitely many values of j corresponding to pairs of N -isogenous curves. This is the case for $N \leq 10$ and for $N = 12, 13, 16, 18$ and 25 . In contrast, when the genus is positive it seems that $H/\Gamma_0(N)$ has only finitely many rational points, and that it has rational points which are not cusps in only finitely many cases.

We can look at these "unusual" isogenies in some detail. The cases where $H/\Gamma_0(N)$ has genus 1 are well known. Jean-René Joly has given a neat account of them. The group of rational points is generated by the cusps in all these cases, and we have the following table

N	11	14	15	17	19	20	21	24	27	32	36	49
# (rational points)	5	6	8	4	3	6	8	8	3	4	6	2
# (rational cusps)	2	4	4	2	2	6	4	8	2	4	6	2
$t(N)$	3	2	4	2	1	0	4	0	1	0	0	0

where now $t(N)$ is the number of values of j for which the elliptic curves (1) will have a cyclic rational subgroup of order N .

The three cases with $N = 11$ are accounted for by the complex multiplication curve 121D, and by the pair of 11-isogenous curves 121F,G. (121D is isogenous to its (-11) -twist 121E, and the pair 121H,I are (-11) -twists of 121F,G.)

The case with $N = 19$ is the family of (-19) -complex multiplication curves with $j = -3^5 2^{15}$; the first such curve is $y^2 + y = x^3 - 38x + 90$, with conductor 361, out of the range of our table.

The case with $N = 27$ is the family with (-27) -complex multiplication, of which the first member is 27C; this is dressed up to look more like an ordinary 27-isogeny involving 27A,B,C,D.

The two cases with $N = 14$ are accounted for by the isogeny class 49ABCD, associated with (-7) -complex multiplication.

The four cases with $N = 15$ are accounted for by the isogeny class 50ABCD.

The four cases with $N = 21$ are the family 63-70-76-83 in Table 4, of which the first representative is the isogeny class 162ABCD.

The cases with $N = 17$ are not in the range of our tables; Vélú has kindly supplied the pair $y^2 + xy + y = x^3 - 3041x + 64278$,
 $y^2 + xy + y = x^3 - 190891x - 36002922$ with conductor 14450; their twists by 5 and by 17 have the same conductor.

When its genus exceeds 1, it seems that $H/\Gamma_0(N)$ hardly ever has non-obvious rational points. For $D = 43, 67, 163$, $H/\Gamma_0(D)$ has a rational point $z = (D + \sqrt{-D})/2D$, corresponding to the curves with $(-D)$ -complex multiplication; the least conductor of such curve is D^2 . More surprisingly, Mazur and Swinnerton-Dyer have found that the curve $H/\Gamma_0(37)$, which has genus 2, has two unobvious rational points, the fixed points of sW , where s is the hyperelliptic involution. According to Vélú, these points give the curve $y^2 + xy + y = x^3 + x^2 - 8x + 6$ of conductor $1225 = 35^2$, and another curve 37-isogenous to it.

Specimens of all the "common" sorts of isogeny are to be found in our tables. The relevant formulae are to be found in the second volume of Fricke's Algebra; when N is prime, the j -invariants of curves with N -isogenies are of the form $R(t)/t$, where R is a polynomial of degree $N+1$ and where t is a uniformising parameter for $H/\Gamma_0(N)$ (the formulae are a trifle worse if N is composite); if the isogeny is to be defined over $\mathbb{Q}$, then t is rational. Consequently, the "common" isogenies with $N = 13, 16, 18, 25$ are really very infrequent.

TABLE 1

Each block of the table is headed by a conductor and its factorisation.
Except for this, the successive groups of columns give

- (i) The conductor, followed by a letter to distinguish the particular curve;
- (ii) a_1, a_2, a_3, a_4, a_6 ;
- (iii) Δ , in factorised form : if the prime factors of the conductor are p_1, p_2, p_3 , then the entry $\pm \lambda \mu \gamma$ means that $\Delta = \pm p_1^\lambda p_2^\mu p_3^\gamma$;
- (iv) The Kodaira symbol, for each prime dividing the conductor;
- (v) The denominator of the j -invariant of the curve, coded as in (iii);
- (vi) The number of rational points of finite order, followed by the rank of the Mordell-Weil group;
- (vii) For each group of isogenous curves, there is a picture showing which curves are isogenous, together with the degree of the isogenies; the "strong Weil curve" is circled. When the curve listed is a "twist" (in the sense of Atkin and Lehner) of an earlier curve, the picture may be replaced or supplemented by a description of the twist; for instance, the entry $57E^*-3$ opposite 171H indicates that 57E is isomorphic to 171H over $Q(\sqrt{-3})$ but not over Q .

Complex multiplication is indicated, in the few cases where it occurs, by "CM-D", where -D is the discriminant of the relevant order.

$$21 = 3.7$$

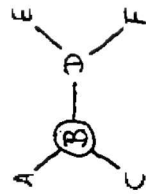
A	1	0	0	1
B	1	0	0	-4
C	1	0	0	-39
D	1	0	0	-49
E	1	0	0	-34
F	1	0	0	-784

0	-	2, 1
-1	+	4, 2
90	+	8, 1
-136	+	2, 4
-217	-	1, 8
-8515	+	1, 2

I2, I1
I4, I2
I8, I1
I2, I4
I1, I8
I1, I2

2, 1
4, 2
8, 1
2, 4
1, 8
1, 2

4 0
8 0
8 0
4 0
2 0
2 0



$$24 = 2.2.2.3$$

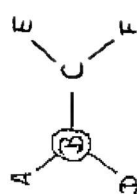
A	0	-1	0	1
B	0	-1	0	-4
C	0	-1	0	-24
D	0	-1	0	-64
E	0	-1	0	16
F	0	-1	0	-394

0	-	4, 1
4	+	8, 2
-36	+	10, 4
220	+	10, 1
-180	-	11, 8
-2772	+	11, 2

III, I1
I*1, I2
III*, I4
III*, I1
II*, I8
II*, I2

0, 1
0, 2
0, 4
0, 1
0, 8
0, 2

4 0
8 0
4 0
4 0
2 0
2 0



$$26 = 2.13$$

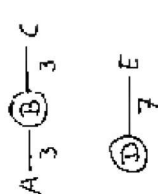
A	1	0	1	0
B	1	0	1	-5
C	1	0	1	-460
D	1	-1	1	-3
E	1	-1	1	-213

0	-	1, 1
-8	-	3, 3
-3830	-	9, 1
3	-	7, 1
-1257	-	1, 7

I1, I1
I3, I3
I9, I1
I7, I1
I1, I7

1, 1
3, 3
9, 1
7, 1
1, 7

3 0
3 0
1 0
7 0
1 0



$$27 = 3.3.3$$

A	0	0	1	0
B	0	0	1	0
C	0	0	1	-30
D	0	0	1	-270

0	-	3
-7	-	9
63	-	5
-1708	-	11

II
IV*
IV
II*



3 0
3 0
3 0
1 0

$$30 = 2.3.5$$

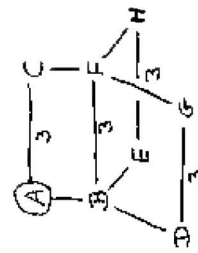
A	1	0	1	1
B	1	0	1	-19
C	1	0	1	-14
D	1	0	1	-69
E	1	0	1	-289
F	1	0	1	-334
G	1	0	1	-5334
H	1	0	1	-454

2	-	4, 3, 1
26	+	2, 6, 2
-64	-	12, 1, 3
-194	+	1, 12, 1
1862	+	1, 3, 4
-2368	+	6, 2, 6
-150369	+	3, 4, 3
-544	+	3, 1, 12

I4, I3, I1
I2, I6, I2
I12, I1, I5
I1, I12, I1
I1, I3, I4
I5, I2, I6
I3, I4, I3
I3, I1, I12

4, 3, 1
2, 6, 2
12, 1, 3
1, 12, 1
1, 3, 4
6, 2, 6
3, 4, 3
3, 1, 12

6 0
12 0
2 0
6 0
6 0
4 0
2 0
2 0



$$32 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

A 0 0 0 0
B 0 0 0 0
C 0 0 0 0
D 0 0 0 0

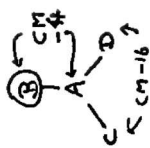
-1
4
-11
-11

0 + 6
0 - 12
-14 + 9
14 + 9

III
I*3
I*0
I*0

0
0
0
0

4 0
4 0
2 0
4 0



$$33 = 3 \cdot 11$$

A 1 1 0 0
B 1 1 0 0
C 1 1 0 0
D 1 1 0 0

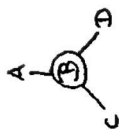
-6
-11
44
-146

-9 + 3, 1
0 + 6, 2
55 - 12, 1
621 + 3, 4

I3, I1
I6, I2
I12, I1
I3, I4

3, 1
6, 2
12, 1
3, 4

2 0
4 0
2 0
4 0



$$34 = 2 \cdot 17$$

A 1 0 0 0
B 1 0 0 0
C 1 0 0 0
D 1 0 0 0

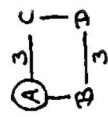
-3
-43
-103
-113

1 + 6, 1
105 + 3, 2
-411 + 2, 3
-329 + 1, 6

I6, I1
I3, I2
I2, I3
I1, I6

6, 1
3, 2
2, 3
1, 6

6 0
6 0
2 0
2 0



$$35 = 5 \cdot 7$$

A 0 1 1 1
B 0 1 1 1
C 0 1 1 1

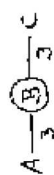
-1
9
-131

0 - 1, 1
1 - 3, 3
-650 - 9, 1

I1, I1
I3, I3
I9, I1

1, 1
3, 3
9, 1

3 0
3 0
1 0



$$36 = 2 \cdot 2 \cdot 3 \cdot 3$$

A 0 0 0 0
B 0 0 0 0
C 0 0 0 0
D 0 0 0 0

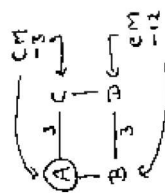
0
-15
0
-135

1 - 4, 3
22 + 8, 3
-27 - 4, 9
-594 + 8, 9

IV, III
IV*, III
IV, III*
IV*, III*

0, 0
0, 0
0, 0
0, 0

6 0
6 0
2 0
2 0



$$37 = 37$$

A 0 0 1 1
B 0 1 1 1
C 0 1 1 1
D 0 1 1 1

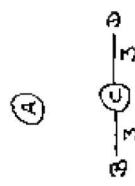
-1
-3
-23
-1073

0 + 1
1 + 1
-50 + 3
-31833 + 1

I1
I1
I3
I1

1
1
3
1

1 1
3 0
3 0
1 0



38 = 2.19									
A	1	1	1	0					
B	1	1	1	-70	1	- 5, 1	15, 11	5, 1	5 0
					-279	- 1, 5	11, 15	1, 5	1 0
39 = 3.13									
C	1	0	1	-16	22	- 3, 1	13, 11	3, 1	3 0
D	1	0	1	9	90	- 9, 3	19, 13	9, 3	3 0
E	1	0	1	-86	-2456	- 27, 1	127, 11	27, 1	1 0
40 = 2.2.2.5									
A	1	1	0	1	0	- 1, 1	11, 11	1, 1	2 0
B	1	1	0	-4	-5	+ 2, 2	12, 12	2, 2	4 0
C	1	1	0	-61	-252	+ 4, 1	14, 11	4, 1	2 0
D	1	1	0	-13	22	+ 1, 4	11, 14	1, 4	4 0
42 = 2.3.7									
A	1	1	1	-4	5	- 8, 2, 1	18, 12, 11	8, 2, 1	8 0
B	1	1	1	-84	261	+ 4, 4, 2	14, 14, 12	4, 4, 2	8 0
C	1	1	1	-104	101	+ 2, 8, 4	12, 18, 14	2, 8, 4	4 0
D	1	1	1	-1344	18405	+ 2, 2, 1	12, 12, 11	2, 2, 1	4 0
E	1	1	1	386	1277	- 1, 16, 2	11, 116, 12	1, 16, 2	2 0
F	1	1	1	-914	-10915	+ 1, 4, 8	11, 14, 18	1, 4, 8	2 0
43 = 43									
A	0	1	1	0	0	- 1	11	1	1 1
44 = 2.2.11									
A	0	1	0	3	-1	- 8, 1	IV*, 11	0, 1	3 0
B	0	1	0	-77	-289	- 8, 3	IV*, 13	0, 3	1 0

51 = 3.17

A 0 1 1 1 1
B 0 1 1 1 -59

-1 - 3, 1
-196 - 1, 3

I3, I1
I1, I3

3, 1
1, 3

3 0
1 0



52 = 2.2.13

A 0 0 0 -4
B 0 0 0 1

-3 + 4, 1
-10 - 6, 2

IV, I1
IV*, I2

0, 1
0, 2

2 0
2 0



53 = 53

A 1 -1 1 0

0 - 1

I1

1

1 1



54 = 2.3.3.3

A 1 -1 1 1
B 1 -1 1 -14
C 1 -1 1 -29

-1 - 3, 3
29 - 9, 5
-53 - 1, 9

I3, I1
I9, IV
I1, IV*

3, 0
9, 0
1, 0

3 0
9 0
1 0



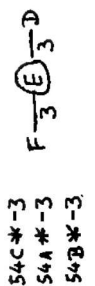
D 1 -1 0 -3
E 1 -1 0 12
F 1 -1 0 -123

3 - 1, 3
8 - 3, 9
-667 - 9, 11

I1, I1
I3, IV*
I9, I1*

1, 0
3, 0
9, 0

3 0
3 0
1 0



55 = 5.11

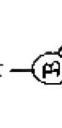
A 1 -1 0 1
B 1 -1 0 -4
C 1 -1 0 -59
D 1 -1 0 -29

0 - 1, 1
3 + 2, 2
190 + 4, 1
-52 + 1, 4

I1, I1
I2, I2
I4, I1
I1, I4

1, 1
2, 2
4, 1
1, 4

2 0
4 0
4 0
2 0



56 = 2.2.2.7

A 0 -1 0 0
B 0 -1 0 -40

-4 - 10, 1
-84 + 11, 2

III*, I1
II*, I2

0, 1
0, 2

2 0
2 0



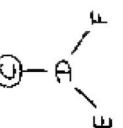
C 0 0 0 1
D 0 0 0 -19
E 0 0 0 -59
F 0 0 0 -299

2 - 8, 1
30 + 10, 2
-138 + 11, 4
1990 + 11, 1

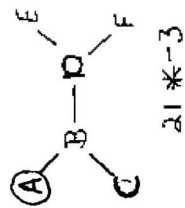
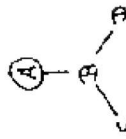
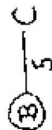
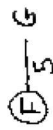
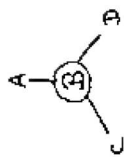
I*, I1
III*, I2
II*, I4
II*, I1

0, 1
0, 2
0, 4
0, 1

4 0
4 0
2 0
2 0



57 = 3.19									
A	1	0	1	-2	-1	+ 1, 1	I1, I1	1, 1	2 0
B	1	0	1	-7	5	+ 2, 2	I2, I2	2, 2	4 0
C	1	0	1	-102	365	+ 4, 1	I4, I1	4, 1	4 0
D	1	0	1	8	29	- 1, 4	I1, I4	1, 4	2 0
E	0	-1	1	-2	2	- 2, 1	I2, I1	2, 1	1 1
F	0	1	1	20	-32	- 10, 1	I10, I1	10, 1	5 0
G	0	1	1	-4390	-113432	- 2, 5	I2, I5	2, 5	1 0
58 = 2.29									
A	1	-1	0	-1	1	- 2, 1	I2, I1	2, 1	1 1
B	1	1	1	5	9	- 10, 1	I10, I1	10, 1	5 0
C	1	1	1	-455	-3951	- 2, 5	I2, I5	2, 5	1 0
61 = 61									
A	1	0	0	-2	1	- 1	I1	1	1 1
62 = 2.31									
A	1	-1	1	-1	1	- 4, 1	I4, I1	4, 1	4 0
B	1	-1	1	-21	41	+ 2, 2	I2, I2	2, 2	4 0
C	1	-1	1	-31	5	+ 1, 4	I1, I4	1, 4	2 0
D	1	-1	1	-331	2397	+ 1, 1	I1, I1	1, 1	2 0
63 = 3.3.7									
A	1	-1	0	9	0	- 8, 1	I*2, I1	2, 1	2 0
B	1	-1	0	-36	27	+ 10, 2	I*4, I2	4, 2	4 0
C	1	-1	0	-351	-2430	+ 14, 1	I*8, I1	8, 1	2 0
D	1	-1	0	-441	3672	+ 8, 4	I*2, I4	2, 4	4 0
E	1	-1	0	-306	5859	- 7, 8	I*1, I6	1, 8	2 0
F	1	-1	0	-7056	229905	+ 7, 2	I*1, I2	1, 2	4 0



[illegible]

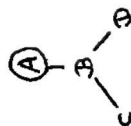
78 = 2.3.13

A	1	1	0	-19
B	1	1	0	-1299
C	1	1	0	-2339
D	1	1	0	-20739

685	-	16, 5, 1
17325	+	8, 10, 2
-15747	+	4, 20, 1
1140957	+	4, 5, 4

I16, I5, I1
I8, I10, I2
I4, I20, I1
I4, I5, I4

16, 5, 1
8, 10, 2
4, 20, 1
4, 5, 4



79 = 79

A	1	1	1	-2
---	---	---	---	----

0	+	1
---	---	---

I1

1

1	1	1
---	---	---



80 = 2.2.2.2.5

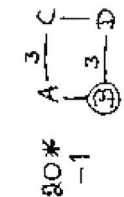
A	0	-1	0	-1
B	0	-1	0	4
C	0	-1	0	-41
D	0	-1	0	-36

0	+	4, 1
-4	-	8, 2
116	+	4, 3
140	-	8, 6

I1, I1
I*0, I2
I1, I3
I*0, I6

0, 1
0, 2
0, 3
0, 6

2	0	2	0
2	0	2	0
2	0	2	0
2	0	2	0



E	0	0	0	-2
F	0	0	0	-7
G	0	0	0	13
H	0	0	0	-107

-1	+	4, 1
6	+	8, 2
34	-	10, 4
426	+	10, 1

I1, I1
I*0, I2
I*2, I4
I*2, I1

0, 1
0, 2
0, 4
0, 1

2	0	2	0
4	0	4	0
4	0	4	0
4	0	4	0



82 = 2.41

A	1	0	1	-2
B	1	0	1	-12

0	+	2, 1
-16	+	1, 2

I2, I1
I1, I2

2, 1
1, 2

2	1	2	1
---	---	---	---



83 = 83

A	1	1	1	1
---	---	---	---	---

0	-	1
---	---	---

I1

1

1	1	1
---	---	---



84 = 2.2.3.7

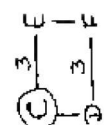
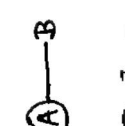
A	0	-1	0	-1
B	0	-1	0	-36
C	0	1	0	7
D	0	1	0	-28
E	0	1	0	-113
F	0	1	0	-1828

-2	-	4, 1, 2
-72	+	8, 2, 1
0	-	4, 3, 2
-28	+	8, 6, 1
-516	-	4, 1, 6
-30700	+	8, 2, 3

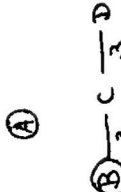
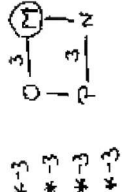
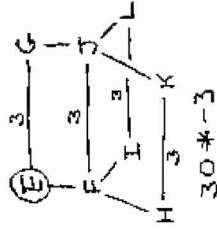
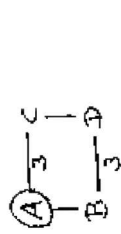
IV, I1, I2
IV*, I2, I1
IV, I3, I2
IV*, I6, I1
IV, I1, I6
IV*, I2, I3

0, 1, 2
0, 2, 1
0, 3, 2
0, 6, 1
0, 1, 6
0, 2, 3

2	0	2	0
2	0	2	0
6	0	6	0
6	0	6	0
2	0	2	0
2	0	2	0



85 = 5.17									
A	1	1	0	-3	-13	+ 2, 1	12, I1	2, 1	2 0
B	1	1	0	-3	-22	- 4, 2	I4, I2	4, 2	2 0
88 = 2.2.2.11									
A	0	0	0	-4	4	- 8, 1	I*1, I1	0, 1	1 1
89 = 89									
A	1	1	0	4	5	- 2	I2	2	2 0
B	1	1	0	-1	0	+ 1	I1	1	2 0
C	1	1	1	-1	0	- 1	I1	1	1 1
90 = 2.3.3.5									
A	1	-1	1	-9	11	- 6, 3, 1	I6, III, I1	6, 0, 1	6 0
B	1	-1	1	-128	597	+ 3, 3, 2	I3, III, I2	3, 0, 2	6 0
C	1	-1	1	52	-53	- 2, 9, 3	I2, III*, I3	2, 0, 3	2 0
D	1	-1	1	-218	-269	+ 1, 9, 6	I1, III*, I6	1, 0, 6	2 0
E	1	-1	1	13	-61	- 4, 9, 1	I4, I*3, I1	4, 3, 1	4 0
F	1	-1	1	-167	-709	+ 2, 12, 2	I2, I*6, I2	2, 6, 2	4 0
G	1	-1	1	-122	1721	- 12, 7, 3	I12, I*1, I3	12, 1, 3	12 0
H	1	-1	1	-617	5231	+ 1, 18, 1	I1, I*12, I1	1, 12, 1	2 0
I	1	-1	1	-2597	-50281	+ 1, 9, 4	I1, I*3, I4	1, 3, 4	2 0
J	1	-1	1	-3002	63929	+ 6, 8, 6	I6, I*2, I6	6, 2, 6	12 0
K	1	-1	1	-48022	4059929	+ 3, 10, 3	I3, I*4, I3	3, 4, 3	6 0
L	1	-1	1	-4082	14681	+ 3, 7, 12	I3, I*1, I12	3, 1, 12	6 0
M	1	-1	0	6	0	- 2, 3, 3	I2, III, I3	2, 0, 3	6 0
N	1	-1	0	-24	13	+ 1, 3, 6	I1, III, I6	1, 0, 6	6 0
O	1	-1	0	-69	-235	- 6, 9, 1	I6, III*, I1	6, 0, 1	2 0
P	1	-1	0	-1149	-14707	+ 3, 9, 2	I3, III*, I2	3, 0, 2	2 0
91 = 7.13									
A	0	0	1	1	0	- 1, 1	I1, I1	1, 1	1 1
B	0	1	1	-7	5	- 1, 1	I1, I1	1, 1	3 1
C	0	1	1	13	42	- 3, 3	I3, I3	3, 3	3 1
D	0	1	1	-117	-1245	- 9, 1	I9, I1	9, 1	1 1



$$92 = 2.2.23$$

A	0	1	0	2
B	0	1	0	-18
C	0	0	0	-1

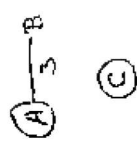
$$1 - 4, 1$$

$$-43 - 4, 3$$

IV, I1
IV, I3
IV, I1

0, 1
0, 3
0, 1

3 0
1 0
1 1



$$94 = 2.47$$

A	1	-1	1	0
B	1	-1	1	-10

$$-1 - 2, 1$$

$$-9 + 1, 2$$

I2, I1
I1, I2

2, 1
1, 2

2 0
2 0



$$96 = 2.2.2.2.2.3$$

A	0	-1	0	-2
B	0	-1	0	-17
C	0	-1	0	8
D	0	-1	0	-32
E	0	1	0	-2
F	0	1	0	-17
G	0	1	0	8
H	0	1	0	-32

$$0 + 6, 2$$

$$33 + 12, 1$$

$$-8 - 9, 4$$

$$-60 + 9, 1$$

$$0 + 6, 2$$

$$-33 + 12, 1$$

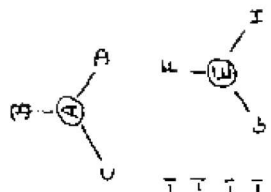
$$8 - 9, 4$$

$$60 + 9, 1$$

I11, I2
I*3, I1
I*0, I4
I*0, I1
I11, I2
I*3, I1
I*0, I4
I*0, I1

0, 2
0, 1
0, 4
0, 1
0, 2
0, 1
0, 4
0, 1

4 0
4 0
2 0
2 0
4 0
2 0
4 0
2 0



$$98 = 2.7.7$$

A	1	1	0	-515
B	1	1	0	-25
C	1	1	0	-1740
D	1	1	0	220
E	1	1	0	-133795
F	1	1	0	-8355

$$-5717 + 1, 6$$

$$-111 - 2, 7$$

$$22184 + 3, 12$$

$$2192 - 5, 9$$

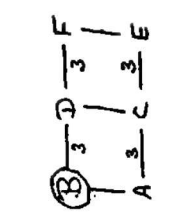
$$18781197 + 9, 8$$

$$291341 - 18, 7$$

I1, I*2
I2, I*1
I3, I*5
I6, I*3
I9, I*2
I18, I*1

1, 2
2, 1
3, 6
6, 3
9, 2
18, 1

2 0
2 0
2 0
2 0
2 0
2 0
2 0
2 0



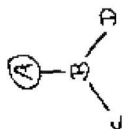
99 = 3.3.11									
A	1	-1	1	-2					
B	1	-1	1	-17					
C	0	0	1	-3					
D	0	0	1	-93					
E	0	0	1	-70383					
F	1	-1	0	-15					
G	1	-1	0	-150					
H	1	-1	1	-59					
I	1	-1	1	-104					
J	1	-1	1	391					
K	1	-1	1	-1319					
100 = 2.2.5.5									
A	0	-1	0	-33					
B	0	-1	0	92					
C	0	-1	0	-1033					
D	0	-1	0	-908					
101 = 101									
A	0	1	1	-1					
102 = 2.3.17									
A	1	0	1	-256					
B	1	0	1	-216					
C	1	0	1	-751					
D	1	0	1	1809					
E	1	1	0	-2					
F	1	1	0	8					
G	1	0	0	-34					
H	1	0	0	-114					
I	1	0	0	226					
J	1	0	0	-1734					
K	1	0	0	-1644					
L	1	0	0	-27744					

104 = 2.2.2.1³
-16

(A)

0, 1 1 0

105 = 3.5.7

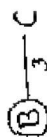


1, 1, 1
2, 2, 2
4, 1, 4
1, 4, 1

106 = 2.53

(A)

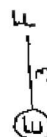
4, 1 1 1



3, 1 3 0
1, 3 1 0

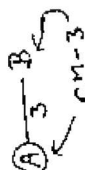
(D)

5, 1 1 0



24, 1 3 1?
8, 3 1 1?

108 = 2.2.3.3.3



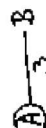
0, 0 3 0
0, 0 1 0

109 = 109

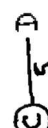
(A)

1 1 0

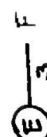
110 = 2.5.11



3, 1, 1 3 0
1, 3, 3 1 0



5, 5, 1 5 0
1, 1, 5 1 0



7, 1, 3 3 0
21, 3, 1 1 0

¹¹² = 2.2.2.2.7

A	0	0	0	1	-2	- 6, 1	I*0, I1	0, 1	2	0	56*	
B	0	0	0	-19	-30	+ 10, 2	I*2, I2	0, 2	4	0	-1	
C	0	0	0	-59	138	+ 11, 4	I*3, I4	0, 4	4	0		
D	0	0	0	-299	-1990	+ 11, 1	I*3, I1	0, 1	2	0		
E	0	-1	0	-8	-16	- 14, 1	I*6, I1	2, 1	2	0		
F	0	-1	0	-168	-784	+ 13, 2	I*5, I2	1, 2	2	0		
G	0	-1	0	72	368	- 18, 3	I*10, I3	6, 3	2	0		
H	0	-1	0	-568	4464	+ 15, 6	I*7, I6	3, 6	2	0		
I	0	-1	0	-2728	55920	- 30, 1	I*22, I1	18, 1	2	0		
J	0	-1	0	-43688	3529328	+ 21, 2	I*13, I2	9, 2	2	0		
K	0	1	0	0	4	- 10, 1	I*2, I1	0, 1	2	1	56*	
L	0	1	0	-40	84	+ 11, 2	I*3, I2	0, 2	2	1	-1	

¹¹³ = 113

A	1	1	1	-2	-2	+ 1	I1	1	2	0	A	
B	1	1	1	3	-4	- 2	I2	2	2	0		

¹¹⁴ = 2.3.19

A	1	0	0	-8	0	+ 6, 3, 1	I6, I3, I1	6, 3, 1	6	0	
B	1	0	0	32	8	- 3, 6, 2	I3, I6, I2	3, 6, 2	6	0	
C	1	0	0	-428	-3444	+ 2, 1, 3	I2, I1, I3	2, 1, 3	2	0	
D	1	0	0	-418	-3610	- 1, 2, 6	I1, I2, I6	1, 2, 6	2	0	
E	1	1	0	-95	-399	+ 2, 5, 1	I2, I5, I1	2, 5, 1	2	0	
F	1	1	0	-65	-473	- 1, 10, 2	I1, I10, I2	1, 10, 2	2	0	
G	1	1	1	-352	-2431	+ 20, 3, 1	I20, I3, I1	20, 3, 1	4	0	
H	1	1	1	-5472	-158079	+ 10, 6, 2	I10, I6, I2	10, 6, 2	4	0	
I	1	1	1	-5312	-167551	- 5, 12, 4	I5, I12, I4	5, 12, 4	2	0	
J	1	1	1	-87552	-10007679	+ 5, 3, 1	I5, I3, I1	5, 3, 1	2	0	

$121 = 11.11$									
A	0	-1	1	-40	-221	-	?	I*1	1 0 11*
B	0	-1	1	-1250	31239	-	11	I*5	1 0 -11
C	0	-1	1	-946260	354509639	-	?	I*1	1 0 $\textcircled{A}-5-B-5-C$
D	0	-1	1	-7	10	-	3	III	1 1 $\textcircled{D}-11-E$
E	0	-1	1	-887	-10143	-	9	III*	1 1 1219*-11 (CM-11)
F	1	1	0	-2	-7	-	4	IV	1 0 $\textcircled{F}-11-G$
G	1	1	0	-3532	82757	-	8	IV*	1 0
H	1	1	1	-30	-76	-	2	II	1 0 1216*-11 I-11
I	1	1	1	-305	7*88	-	10	II*	1 0 121F*-11 I-11 $\textcircled{H}$
$122 = 2.61$									
A	1	0	1	2	0	-	4, 1	I4, I1	1 1 $\textcircled{A}$
$123 = 3.41$									
A	0	1	1	-10	10	-	5, 1	I5, I1	5 1 $\textcircled{A}-5-B$
B	0	1	1	20	-890	-	1, 5	I1, I5	1 1
C	0	-1	1	1	-1	-	1, 1	I1, I1	1 1 $\textcircled{C}$
$124 = 2.2.31$									
A	0	0	0	-17	-27	-	4, 1	IV, I1	1 0 $\textcircled{A}$
B	0	1	0	-2	1	-	4, 1	IV, I1	3 1 $\textcircled{B}-3-C$
C	0	1	0	18	-11	-	4, 3	IV, I3	1 1

115 = 5.23

7

(A)

1 0

5, 1

15, 11

- 5, 1

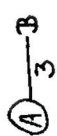
-11

A

116 = 2.2.29

-4

36



3 0

0, 1

IV*, 11

- 8, 1

4

A

-3

-4



2 0

0, 1

IV, 11

+ 4, 1

14

C

-4

-4

(E)

2 0

0, 2

IV*, 12

- 8, 2

24

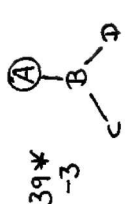
D

117 = 3.3.13

4

-41

-626



4 1

1, 1

I*, 11

- 7, 1

6

A

-41

-626

-176

39*

4 1

2, 2

I*, 12

+ 8, 2

96

B

-176

-176

-3

2 1

4, 1

I*, 11

+ 10, 1

6180

C

118 = 2.59

1

-25

115

(A)

1 1

2, 1

I2, 11

- 2, 1

1

A

-25

115



5 0

10, 1

I10, 11

- 10, 1

39

B

-4

-4

(P)

1 0

1, 1

I1, 11

- 1, 1

-5

D

56

56

(E)

1 0

19, 1

I19, 11

- 19, 1

-192

E

120 = 2.2.2.3.5

4

-16

-216

-136



2 0

0, 1, 1

I*, 11

- 8, 1, 1

0

A

-16

-216

-136

3

4 0

0, 2, 2

III*, 12

+ 10, 2, 2

-16

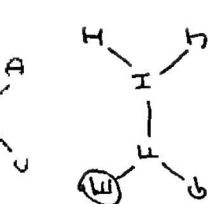
B

-20

80

-200

-80



4 0

0, 2, 1

III, 11

+ 4, 2, 1

16

E

-20

80

-200

-80

5

6 0

0, 4, 2

I*, 12

+ 8, 4, 2

0

F

80

-200

-80

-3200

7

8 0

0, 8, 1

III*, 11

- 10, 8, 1

80

G

-200

-80

-3200

9

10 0

0, 2, 4

III*, 12

+ 10, 2, 4

-1152

H

-80

-3200

11

12 0

0, 1, 8

II*, 11

- 11, 1, 8

-2400

I

-3200

-3200

13

14 0

0, 1, 2

II*, 12

+ 11, 1, 2

-70752

J

126 = 2.3.3.7

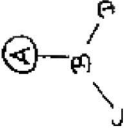
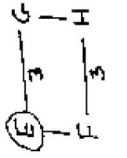
A	1	-1	1	-5	-7	-2, 6, 1	I2, I*0, I1	2, 0, 1	2	0	← Strong V ₄ -1 case
B	1	-1	1	-95	-331	+ 1, 6, 2	I1, I*0, I2	1, 0, 2	2	0	
C	1	-1	1	40	155	- 6, 6, 3	I6, I*0, I3	6, 0, 3	6	0	14*-3
D	1	-1	1	-320	1893	+ 3, 6, 6	I3, I*0, I6	3, 0, 6	6	0	
E	1	-1	1	-1535	23591	- 18, 6, 1	I18, I*0, I1	18, 0, 1	6	0	
F	1	-1	1	-24575	1488935	+ 9, 6, 2	I9, I*0, I2	9, 0, 2	6	0	
G	1	-1	0	-36	-178	- 8, 8, 1	I8, I*2, I1	8, 2, 1	2	0	←
H	1	-1	0	-756	-7808	+ 4, 10, 2	I4, I*4, I2	4, 4, 2	4	0	
I	1	-1	0	-936	-3668	+ 2, 14, 4	I2, I*8, I4	2, 8, 4	4	0	42*-3
J	1	-1	0	-12096	-509036	+ 2, 8, 1	I2, I*2, I1	2, 2, 1	2	0	
K	1	-1	0	3474	-31010	- 1, 22, 2	I1, I*16, I2	1, 16, 2	2	0	
L	1	-1	0	-8226	286474	+ 1, 10, 8	I1, I*4, I8	1, 4, 8	2	0	

128 = 2.2.2.2.2.2.2

A	0	-1	0	1	-1	- 8	III	0	2	0	(A) — B
B	0	-1	0	-9	-7	+ 13	I*2	0	2	0	
C	0	1	0	1	1	- 8	III	0	2	1	A*-1 (C) — D
D	0	1	0	-9	7	+ 13	I*2	0	2	1	B*-1
E	0	1	0	-2	-2	+ 7	II	0	2	0	(E) — F
F	0	1	0	3	-5	- 14	III*	0	2	0	A*2
G	0	-1	0	3	5	- 14	III*	0	2	0	A*-2 (G) — H
H	0	-1	0	-2	2	+ 7	II	0	2	0	B*-2

129 = 3.43

A	1	0	1	-25	-49	+ 3, 1	I3, I1	3, 1	2	0	A
B	1	0	1	-30	-29	+ 6, 2	I6, I2	6, 2	4	0	(B) — C
C	1	0	1	-245	1433	+ 12, 1	I12, I1	12, 1	4	0	
D	1	0	1	105	-191	- 3, 4	I3, I4	3, 4	2	0	
E	0	-1	1	-19	39	- 4, 1	I4, I1	4, 1	1	1	(E)

$130 = 2.5.13$									
A	1	-1	1	-7	-1	+ 8, 1, 1	18, 11, 11	4, 0	
B	1	-1	1	-87	-289	+ 4, 2, 2	14, 12, 12	4, 0	
C	1	-1	1	-67	-441	- 2, 4, 4	12, 14, 14	4, 0	
D	1	-1	1	-1387	-19529	+ 2, 1, 1	12, 11, 11	2, 0	
E	1	0	1	-33	68	+ 4, 3, 1	14, 13, 11	6, 1	
F	1	0	1	-13	158	- 2, 6, 2	12, 16, 12	6, 1	
G	1	0	1	-208	-1122	+ 12, 1, 3	112, 11, 13	2, 1	
H	1	0	1	112	-4194	- 6, 2, 6	16, 12, 16	2, 1	
I	1	1	1	-761	-11561	- 4, 10, 2	14, 110, 12	2, 0	
J	1	1	1	-841	-9737	+ 8, 5, 1	18, 15, 11	2, 0	

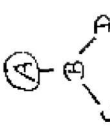
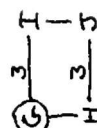
$131 = 131$									
A	0	-1	1	1	0	- 1	11	1, 1	

$132 = 2.2.3.11$									
A	0	1	0	3	0	- 4, 2, 1	14, 12, 11	2, 0	
B	0	1	0	-12	-12	+ 8, 1, 2	14*, 11, 12	2, 0	
C	0	-1	0	-77	330	- 4, 10, 1	14, 110, 11	2, 0	
D	0	-1	0	-1292	18312	+ 8, 5, 2	14*, 15, 12	2, 0	

$135 = 3.3.3.5$									
A	0	0	1	-3	4	- 5, 2	14, 12	1, 1	
B	0	0	1	-27	-115	- 11, 2	11*, 12	1, 0	

$136 = 2.2.2.17$									
A	0	1	0	-4	0	+ 8, 1	14*, 11	2, 1	
B	0	1	0	16	16	- 10, 2	111*, 12	2, 1	
C	0	-1	0	-8	-4	+ 10, 1	111*, 11	2, 0	
D	0	-1	0	-48	140	+ 11, 2	11*, 12	2, 0	

138 = 2.3.23

A	1	1	1	3	-	4, 2, 1	I4, I2, I1	4, 2, 1	4 0	
B	1	1	1	-17	+	2, 4, 2	I2, I4, I2	2, 4, 2	4 0	
C	1	1	1	-247	+	1, 8, 1	I1, I8, I1	1, 8, 1	2 0	
D	1	1	1	-107	+	1, 2, 4	I1, I2, I4	1, 2, 4	2 0	
E	1	1	0	-1	-	2, 2, 1	I2, I2, I1	2, 2, 1	2 1	
F	1	1	0	-31	+	1, 1, 2	I1, I1, I2	1, 1, 2	2 1	
G	1	0	1	-36	-	4, 6, 1	I4, I6, I1	4, 6, 1	6 0	
H	1	0	1	-576	+	2, 3, 2	I2, I3, I2	2, 3, 2	6 0	
I	1	0	1	189	-	12, 2, 3	I12, I2, I3	12, 2, 3	2 0	
J	1	0	1	-771	+	6, 1, 6	I6, I1, I6	6, 1, 6	2 0	

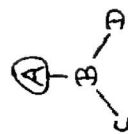
139 = 139

A	1	1	0	-3	-4	-	1	I1	1	
---	---	---	---	----	----	---	---	----	---	---

140 = 2.2.5.7

A	0	1	0	-5	-25	-	8, 3, 1	IV*, I3, I1	3 0	
B	0	1	0	-805	-	8, 1, 3	IV*, I1, I3	0, 1, 3	1 0	
C	0	0	0	32	212	-	8, 1, 5	IV*, I1, I5	1 0	

141 = 3.47

A	1	0	0	-2	3	-	4, 1	I4, I1	4 0	
B	1	0	0	-47	120	+	2, 2	I2, I2	4 0	
C	1	0	0	-62	33	+	1, 4	I1, I4	2 0	
D	1	0	0	-752	7875	+	1, 1	I1, I1	2 0	
E	0	1	1	-12	2	+	7, 1	I7, I1	1 1	
F	1	1	1	-143	-718	+	3, 2	I3, I2	2 0	
G	1	1	1	-8	-16	-	6, 1	I6, I1	2 0	
H	0	1	1	-26	-61	+	1, 1	I1, I1	1 0	
I	0	-1	1	-1	0	+	1, 1	I1, I1	1 1	

$^{142} = 2.71$									
A	1	-1	0	-1	-3	-	6, 1	16, I1	6, 1
B	1	-1	0	-41	-91	+	3, 2	13, I2	3, 2
C	1	0	0	-8	8	+	3, 1	13, I1	3, 1
D	1	0	0	-58	-170	+	1, 3	11, I3	1, 3
E	1	1	0	-1	-1	+	1, 1	11, I1	1, 1
F	1	-1	1	-12	15	+	9, 1	19, I1	1, 1
G	1	-1	0	-2626	52244	+	27, 1	127, I1	1 0?
$^{143} = 11.13$									
A	0	-1	1	-1	-2	-	1, 2	11, I2	1 1
$^{144} = 2.2.2.2.3.3$									
A	0	0	0	0	-1	-	4, 3	11, III	2 0 $\leftarrow$ String Viol
B	0	0	0	-15	-22	+	8, 3	I*0, III	2 0 $\leftarrow$ String Viol
C	0	0	0	0	27	-	4, 9	II, III*	2 0 $\leftarrow$ String Viol
D	0	0	0	-135	594	+	8, 9	I*0, III*	2 0 $\leftarrow$ String Viol
E	0	0	0	6	7	-	4, 7	II, I*1	2 0 $\leftarrow$ String Viol
F	0	0	0	-39	70	+	8, 8	I*0, I*2	4 0
G	0	0	0	-219	-1190	+	10, 10	I*2, I*4	4 0
H	0	0	0	-579	5362	+	10, 7	I*2, I*1	4 0
I	0	0	0	141	-4718	-	11, 14	I*3, I*8	2 0
J	0	0	0	-3459	-78302	+	11, 8	I*3, I*2	2 0
$^{145} = 5.29$									
A	1	-1	1	-3	2	+	1, 1	11, I1	2 1
B	1	-1	1	2	6	-	2, 2	12, I2	2 1

(A) — B

(C) — 3 — D

(E)

(F)

(G)

String Viol
 $\leftarrow$ String Viol
 36 * -1
 (cM - 3)

String Viol
 $\leftarrow$ String Viol
 24 * -3

(A) — B

147 = 3.7.7										
A	0	-1	1	-2	-1	- 1, 2	II, II	1	0	(A) 13-B
B	0	-1	1	-912	10919	- 13, 2	II13, II	1	0	
C	1	1	1	48	48	- 2, 7	I2, I*1	4	0	← strong light zone
D	1	1	1	-197	146	+ 4, 8	I4, I*2	4	0	
E	1	1	1	-1912	-32792	+ 8, 7	I8, I*1	2	0	21*
F	1	1	1	-2402	44246	+ 2, 10	I2, I*4	4	0	-7
G	1	1	1	-1667	72764	- 1, 14	I1, I*8	2	0	
H	1	1	1	-38417	2682228	+ 1, 8	I1, I*2	2	0	
I	0	1	1	-114	473	- 1, 8	I1, IV*	1	0	A*-7
J	0	1	1	-44704	-3655907	- 13, 8	II13, IV*	1	0	(I) 13-J

A	0	-1	0	-5	1	+ 8,	1	IV*, II	0, 1	1	1
				$^{148} = 2.2.37$							(A)

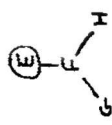
[illegible]

152 = 2.2.2.19

A	0	1	0	-1	3	-	8, 1	I*, I1	0, 1	1	1	(A)
B	0	1	0	-3	-16	-	11, 1	II*, I1	0, 1	1	0	(B)

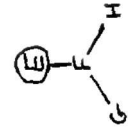
153 = 3.3.17

A	0	0	1	6	27	-	9, 1	I*, I1	3, 1	1	1	1 51A*
B	0	0	1	-534	4752	-	7, 3	I*, I3	1, 3	3	1	1 51B*
C	0	0	1	-3	2	-	3, 1	III, I1	0, 1	1	1	(C)
D	0	0	1	-27	-61	-	9, 1	III*, I1	0, 1	1	0	C*-3 (D)
E	1	-1	0	-6	-1	+	6, 1	I*, I1	0, 1	2	0	17A*-3
F	1	-1	0	-51	152	+	6, 2	I*, I2	0, 2	4	0	17B*-3
G	1	-1	0	-6	377	-	6, 4	I*, I4	0, 4	2	0	17C*-3
H	1	-1	0	-816	9179	+	6, 1	I*, I1	0, 1	2	0	17D*-3



154 = 2.7.11

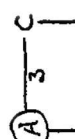
A	1	1	0	-14	-28	-	4, 1, 2	I4, I1, I2	4, 1, 2	2	0	(A)-B
B	1	1	0	-234	-1480	+	2, 2, 1	I2, I2, I1	2, 2, 1	2	0	
C	1	-1	0	-29	69	-	6, 1, 2	I6, I1, I2	6, 1, 2	2	1	(C)-D
D	1	-1	0	-469	4029	+	3, 2, 1	I3, I2, I1	3, 2, 1	2	1	
E	1	-1	1	-4	-89	-	12, 1, 2	I12, I1, I2	12, 1, 2	4	0	(E)-F
F	1	-1	1	-324	-2137	+	6, 2, 4	I6, I2, I4	6, 2, 4	4	0	
G	1	-1	1	-5164	-141529	+	3, 4, 2	I3, I4, I2	3, 4, 2	2	0	
H	1	-1	1	-604	2343	+	3, 1, 8	I3, I1, I8	3, 1, 8	2	0	



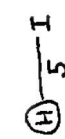
155 = 5.31

A	1	1	1	-1	-2	-	2, 1	I2, I1	2, 1	2	0	(A)-B
B	1	1	1	-26	-62	+	1, 2	I1, I2	1, 2	2	0	
C	0	-1	1	-1	1	-	1, 1	I1, I1	1, 1	1	1	(C)
D	0	-1	1	10	6	-	5, 1	I5, I1	5, 1	5	1	(D)-5-E
E	0	-1	1	-840	-9114	-	1, 5	I1, I5	1, 5	1	1	

$$156 = 2.2.3.13$$

A	0	1	0	-4	+ 4, 6, 1	IV, I6, I1	0, 6, 1	6	0	
B	0	1	0	644	+ 8, 3, 2	IV*, I3, I2	0, 3, 2	6	0	
C	0	1	0	-7888	+ 4, 2, 3	IV, I2, I3	0, 2, 3	2	0	
D	0	1	0	-7564	+ 8, 1, 6	IV*, I1, I6	0, 1, 6	2	0	
E	0	-1	0	6	+ 4, 2, 1	IV, I2, I1	0, 2, 1	2	1	
F	0	-1	0	-24	+ 8, 1, 2	IV*, I1, I2	0, 1, 2	2	1	

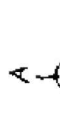
$$158 = 2.79$$

A	1	0	1	118	+ 2, 1	I2, I1	2, 1	3	0	
B	1	0	1	-92	+ 6, 3	I6, I3	6, 3	3	0	
C	1	0	1	-145452	+ 18, 1	I18, I1	18, 1	1	0	
D	1	1	0	1	+ 2, 1	I2, I1	2, 1	1	1	
E	1	-1	1	9	+ 8, 1	I8, I1	8, 1	1	1	
F	1	1	1	1	- 2, 1	I2, I1	2, 1	2	0	
G	1	1	1	5	+ 1, 2	I1, I2	1, 2	2	0	
H	1	1	1	3109	+ 20, 1	I20, I1	20, 1	5	0	
I	1	1	1	-23380	+ 4, 5	I4, I5	4, 5	1	0	

$$160 = 2.2.2.2.2.5$$

A	0	-1	0	-4	+ 6, 1	III, I1	0, 1	2	0	
B	0	-1	0	-15	- 12, 2	I*3, I2	0, 2	2	0	
C	0	1	0	15	- 12, 2	I*3, I2	0, 2	2	1	
D	0	1	0	4	+ 6, 1	III, I1	0, 1	2	1	

$$161 = 7.23$$

A	1	-1	1	-2	+ 1, 1	I1, I1	1, 1	2	0	
B	1	-1	1	8	+ 2, 2	I2, I2	2, 2	4	0	
C	1	-1	1	560	+ 4, 1	I4, I1	4, 1	4	0	
D	1	-1	1	36	- 1, 4	I1, I4	1, 4	2	0	

162 = 2.3.3.3.3											
A	1	-1	0	3	-1	-	1, 6	I1, IV	1, 0	3 0	
B	1	-1	0	-42	-100	-	3, 10	I3, IV*	3, 0	1 0	
C	1	-1	0	-852	19664	-	21, 10	I21, IV*	21, 0	1 0	
D	1	-1	0	-1077	13977	-	7, 6	I7, IV	7, 0	3 0	
E	1	-1	1	4	-1	-	6, 4	I6, II	6, 0	3 0	
F	1	-1	1	-56	-161	-	2, 12	I2, II*	2, 0	1 0	
G	1	-1	1	-5	5	-	3, 4	I3, II	3, 0	3 0	
H	1	-1	1	25	1	-	1, 12	I1, II*	1, 0	1 0	
I	1	-1	1	-95	-697	-	21, 4	I21, II	21, 0	3 0	
J	1	-1	1	-9695	-364985	-	7, 12	I7, II*	7, 0	1 0	
K	1	-1	0	-6	8	-	2, 6	I2, IV	2, 0	3 1	
L	1	-1	0	39	-19	-	6, 10	I6, IV*	6, 0	1 1	
163 = 163											
A	0	0	1	-2	1	-	1	I1	1	1 1	
166 = 2.83											
A	1	1	0	-5	4	-	4, 1	I4, I1	4, 1	1 1	
168 = 2.2.2.3.7											
A	0	1	0	-12	0	+	8, 2, 2	I*1, I2, I2	0, 2, 2	4 0	
B	0	1	0	-7	-10	+	4, 1, 1	III, I1, I1	0, 1, 1	2 0	
C	0	1	0	-152	672	+	10, 4, 1	III*, I4, I1	0, 4, 1	4 0	
D	0	1	0	48	48	-	10, 1, 4	III*, I1, I4	0, 1, 4	2 0	
E	0	-1	0	-7	52	-	4, 3, 4	III, I3, I4	0, 3, 4	4 0	
F	0	-1	0	-252	1620	+	8, 6, 2	I*1, I6, I2	0, 6, 2	4 0	
G	0	-1	0	-392	-228	+	10, 12, 1	III*, I12, I1	0, 12, 1	2 0	
H	0	-1	0	-4032	99900	+	10, 3, 1	III*, I3, I1	0, 3, 1	2 0	

$$170 = 2.5.17$$

A	1	0	1	-8	6	+	4, 2, 1	I4,	I2,	I1	4, 2, 1	2	1	(A) — B
B	1	0	1	12	38	-	2, 4, 2	I2,	I4,	I2	2, 4, 2	2	1	
C	1	-1	0	-10	-10	-	1, 1, 1	I1,	I1,	I1	1, 1, 1	1	0	(C)
D	1	0	1	-3	6	-	3, 3, 1	I3,	I3,	I1	3, 3, 1	3	0	(D) — E
E	1	0	1	22	-164	-	9, 1, 3	I9,	I1,	I3	9, 1, 3	1	0	
F	1	0	0	399	-919	-	21, 3, 1	I21,	I3,	I1	21, 3, 1	3	0?	(F) — G
G	1	0	0	-6641	-215575	-	7, 9, 3	I7,	I9,	I3	7, 9, 3	1	0?	
H	1	0	1	-2554	49452	+	8, 2, 3	I8,	I2,	I3	8, 2, 3	6	0	(H) — J
I	1	0	1	-2474	52716	-	4, 4, 6	I4,	I4,	I6	4, 4, 6	6	0	
J	1	0	1	-4169	-20724	+	24, 6, 1	I24,	I6,	I1	24, 6, 1	2	0	I — K
K	1	0	1	16311	-159968	-	12, 12, 2	I12,	I12,	I2	12, 12, 2	2	0	

107

$$171 = 3.3.19$$

A	0	0	1	6	0	-	6, 1	I*0,	I1	0, 1	1	1	(A) — B — C
B	0	0	1	-84	315	-	6, 3	I*0,	I3	0, 3	3	1	19*-3
C	0	0	1	-6924	221760	-	6, 1	I*0,	I1	0, 1	3	1	
D	1	-1	1	-14	20	+	7, 1	I*1,	I1	1, 1	4	0	57*-3
E	1	-1	1	-59	-142	+	8, 2	I*2,	I2	2, 2	4	0	
F	1	-1	1	-914	-10402	+	10, 1	I*4,	I1	4, 1	2	0	
G	1	-1	1	76	-790	-	7, 4	I*1,	I4	1, 4	2	0	
H	0	0	1	-21	-41	-	8, 1	I*2,	I1	2, 1	1	0	57E*-3 (H)
I	0	0	1	177	1035	-	16, 1	I*10,	I1	10, 1	1	0	57*-3 (I) — J
J	0	0	1	-39513	3023145	-	8, 5	I*2,	I5	2, 5	1	0	



$$172 = 2.2.43$$

A	0	1	0	-13	15	-	8, 1	I7*,	I1	0, 1	3	1	(A) — B
B	0	1	0	57	79	-	8, 3	I7*,	I3	0, 3	1	1	

A	1	0	1	-2	-	4, 1, 1	I4,	I1,	I1
B	1	0	1	-34	+ 2, 2, 2	2, 2, 2	I2,	I2,	I2
C	1	0	1	-310	+ 1, 4, 1	1, 4, 1	I1,	I4,	I1
D	1	0	1	-50	+ 1, 1, 4	1, 1, 4	I1,	I1,	I4
E	1	1	0	-56	- 13, 1, 1	13, 1, 1	I13,	I1,	I1
F	1	1	1	-5	- 1, 3, 1	1, 3, 1	I1,	I3,	I1
G	1	0	0	-1	- 7, 7, 1	7, 7, 1	I7,	I7,	I1
H	1	0	0	-6511	- 1, 1, 7	1, 1, 7	I1,	I1,	I7
I	1	0	1	-7705	- 11, 21, 1	11, 21, 1	I11,	I21,	I1
J	1	0	1	68340	- 33, 7, 3	33, 7, 3	I33,	I7,	I3

A	0	-1	1		175 = 5.5.7 -148	748	-	3, 5	III, I5}		0, 5	5 1 } A — ⑧ ₅
B	0	-1	1	2		-2	-	3, 1	III, II }		0, 1	1 1 }
C	0	-1	1	-33		93	-	7, 1	I*1, I1		1, 1	1 1 C — ③ — ③ — ε
D	0	-1	1	217		-282	-	9, 3	I*3, I3		3, 3	1 1 35 * 5
E	0	-1	1	-5283		-74657	-	15, 1	I*9, I1		9, 1	1 1
F	0	1	1	42		-131	-	9, 1	III*, I1		0, 1	1 0 D * 5 G — ⑤ — ⑥
G	0	1	1	-3708		86119	-	9, 5	III*, I5		0, 5	1 0 A * 5

A	0	-1	0	3	1	-	8,	1	I*,	I1	0,	1	1	1	44*	(A)	3-B
B	0	-1	0	-77	289	-	8,	3	I*,	I3	0,	3	1	1	-1		
C	0	0	0	-4	-4	-	8,	1	I*,	I1	0,	1	1	0	88*-1	(C)	
D	0	1	0	-5	-13	-	12,	1	II*,	I1	0,	1	1	0	(D)	5-E-5-F	
E	0	1	0	-165	1427	-	12,	5	II*,	I5	0,	5	1	0			
F	0	1	0	-125125	16994227	-	12,	1	II*,	I1	0,	1	1	0			11*-1

$$184 = 2.2.2.2.23$$

A	0	0	0	-157	- 4, 1	III, I1	0, 1	1 0	(A)
B	0	-1	0	5	- 4, 1	III, I1	0, 1	1 1	(B)
C	0	-1	0	1	- 4, 1	III, I1	0, 1	1 1	(C)
D	0	0	0	6	- 10, 1	III*, I1	0, 1	2 0	(D) — E
E	0	0	0	62	+ 11, 2	II*, I2	0, 2	2 0	

$$185 = 5.37$$

A	0	-1	1	6	+ 2, 1	I2, I1	2, 1	1 1	(A)
B	1	0	1	-3	+ 1, 1	I1, I1	1, 1	2 1	(B) — C
C	1	0	1	-9	- 2, 2	I2, I2	2, 2	2 1	
D	0	1	1	700	+ 4, 1	I4, I1	4, 1	1 1	(D)

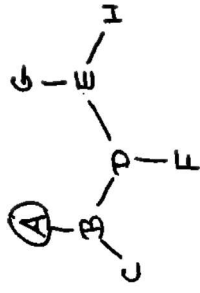
$$186 = 2.3.31$$

A	1	0	1	-26	- 7, 1, 1	I7, I1, I1	7, 1, 1	1 0	(A)
B	1	0	0	9	- 5, 5, 1	I5, I5, I1	5, 5, 1	5 0	(B) — 5 — C
C	1	0	0	-20181	- 1, 1, 5	I1, I1, I5	1, 1, 5	1 0	
D	1	1	0	-369	- 1, 11, 1	I1, I11, I1	1, 11, 1	1 0	(D)

$$187 = 11.17$$

A	0	1	1	30	- 3, 2	I3, I2	3, 2	3 0	(A) — 3 — B
B	0	1	1	-905	- 1, 6	I1, I6	1, 6	1 0	
C	0	0	1	1	- 3, 1	I3, I1	3, 1	1 0	(C)

Q	0	-1	0	-4	-2	+	6, 1	I1, I1	0, 1	2	1	←
R	0	-1	0	-9	9	+	12, 2	I*2, I2	0, 2	4	1	96 AB *-2
S	0	-1	0	31	33	-	15, 4	I*5, I4	0, 4	2	1	
T	0	-1	0	-129	609	+	15, 1	I*5, I1	0, 1	4	1	
194 = 2.97												
A	1	-1	1	-3	-1	+	2, 1	I2, I1	2, 1	2	0	(A) — B
B	1	-1	1	-13	19	+	1, 2	I1, I2	1, 2	2	0	
195 = 3.5.13												
A	1	0	0	-110	435	+	4, 1, 1	I4, I1, I1	4, 1, 1	4	0	(A)
B	1	0	0	-115	392	+	8, 2, 2	I8, I2, I2	8, 2, 2	8	0	
C	1	0	0	216	2277	-	16, 1, 1	I16, I1, I1	16, 1, 1	4	0	
D	1	0	0	-520	-4225	+	4, 4, 4	I4, I4, I4	4, 4, 4	8	0	
E	1	0	0	-8125	-282568	+	2, 8, 2	I2, I8, I2	2, 8, 2	4	0	
F	1	0	0	605	-19750	-	2, 2, 8	I2, I2, I8	2, 2, 8	4	0	
G	1	0	0	-7930	-296725	-	1, 16, 1	I1, I16, I1	1, 16, 1	2	0	
H	1	0	0	-130000	-18051943	+	1, 4, 1	I1, I4, I1	1, 4, 1	2	0	
I	0	1	1	0	-1	-	1, 1, 1	I1, I1, I1	1, 1, 1	1	0	(I)
J	0	-1	1	-190	1101	-	7, 1, 3	I7, I1, I3	7, 1, 3	1	0?	(5)
K	0	1	1	-66	-349	-	3, 7, 1	I3, I7, I1	3, 7, 1	1	0	(K)
196 = 2.2.7.7												
A	0	-1	0	-2	1	+	4, 2	IV, II	0, 0	1	1	(A) 3 — B
B	0	-1	0	-142	701	+	4, 2	IV, II	0, 0	1	1	
C	0	1	0	-114	-127	+	4, 8	IV, IV*	0, 0	3	0	A* -7 (C) 3 — D
D	0	1	0	-6974	-226507	+	4, 8	IV, IV*	0, 0	1	0	B* -7
197 = 197												
A	0	0	1	-5	4	+	1	I1	1	1	1	(A)



198 = 2.3.3.11									
A	1 -1 0	-87	333	+ 4, 3, 3	I4, III, I3	4, 0, 3	6 0		
B	1 -1 0	-147	-135	+ 2, 3, 6	I2, III, I6	2, 0, 6	6 0		
C	1 -1 0	-582	-5068	+ 12, 9, 1	II2, III*, I1	12, 0, 1	2 0		
D	1 -1 0	-9222	-338572	+ 6, 9, 2	I6, III*, I2	6, 0, 2	2 0		
E	1 -1 1	-50	-115	+ 2, 9, 1	I2, I*3, I1	2, 3, 1	2 0		
F	1 -1 1	40	-547	- 1, 12, 2	I1, I*6, I2	1, 6, 2	2 0		
G	1 -1 1	-725	7661	+ 6, 7, 3	I6, I*1, I3	6, 1, 3	6 0		
H	1 -1 1	-365	15005	- 5, 8, 6	I3, I*2, I6	3, 2, 6	6 0		
I	1 -1 0	-18	4	+ 4, 7, 1	I4, I*1, I1	4, 1, 1	2 1		
J	1 -1 0	-198	1120	+ 2, 8, 2	I2, I*2, I2	2, 2, 2	4 1		
K	1 -1 0	-108	2074	- 1, 10, 4	I1, I*4, I4	1, 4, 4	2 1		
L	1 -1 0	-3168	69430	+ 1, 7, 1	I1, I*1, I1	1, 1, 1	2 1		
M	1 -1 1	-65	209	+ 12, 3, 1	II2, III, I1	12, 0, 1	6 0		
N	1 -1 1	-1025	12891	+ 6, 3, 2	I6, III, I2	6, 0, 2	6 0		
O	1 -1 1	-785	-8207	+ 4, 9, 3	I4, III*, I3	4, 0, 3	2 0		
P	1 -1 1	-1325	4959	+ 2, 9, 6	I2, III*, I6	2, 0, 6	2 0		
Q	1 -1 0	-405	-2187	+ 10, 11, 1	I10, I*5, I1	10, 5, 1	2 0		
R	1 -1 0	1035	-15147	- 5, 16, 2	I5, I*10, I2	5, 10, 2	2 0		
S	1 -1 0	-90585	10516473	+ 2, 7, 5	I2, I*1, I5	2, 1, 5	2 0		
T	1 -1 0	-90495	10538343	- 1, 9, 10	I1, I*2, I10	1, 2, 10	2 0		
200 = 2.2.2.5.5									
A	0 0 0	5	-10	- 11, 2	II*, II	0, 0	1 0		
B	0 0 0	125	-1250	- 11, 8	II*, IV*	0, 0	1 0		
C	0 1 0	-3	-2	+ 4, 3	III, III	0, 0	2 1		
D	0 1 0	-28	48	+ 8, 3	I*1, III	0, 0	2 1		
E	0 -1 0	-83	-88	+ 4, 9	III, III*	0, 0	2 0		
F	0 -1 0	-708	7412	+ 8, 9	I*1, III*	0, 0	2 0		
G	0 0 0	-50	125	+ 4, 7	III, I*1	0, 1	4 0		
H	0 0 0	-175	-750	+ 8, 8	I*1, I*2	0, 2	4 0		
I	0 0 0	325	-4250	- 10, 10	III*, I*4	0, 4	2 0		
J	0 0 0	-2675	-53250	+ 10, 7	III*, I*1	0, 1	2 0		

TABLE 2

We list a small integer point (x,y) for every curve in Table 1 of which the Mordell-Weil group has positive rank. This point is either a generator, or just possibly a multiple of a generator with non-integral coordinates.

Rather surprisingly, it appears that for $N \leq 200$ the rank never exceeds 1.

Curve	x	y			
37A	0	0	0	0	0
43A	0	0	-1	1	1
53A	0	0	1	1	1
57E	2	1	0	1	1
58A	0	1	-1	2	2
61A	1	0	-1	2	2
65A	-1	1	5	13	13
77F	2	3	0	1	1
79A	0	0	1	0	0
82A	0	0	0	2	2
83A	0	0	0	1	1
88A	2	2	1	1	1
89C	0	0	0	4	4
91A	0	0	-1	4	4
91B	-1	3	2	0	0
92C	1	1	1	0	0
99A	0	0	1	0	0
101A	-1	0	0	2	2
102F	-1	2	2	1	1
106A	2	1	2	4	4
112K	0	2	2	1	1
117A	0	2	-3	12	12
118A	0	1	1	2	2
121D	4	5	2	1	1
122A	1	1	0	1	1
123A	1	1	0	2	2
123B	1	0	3	2	2
124B	1	1	4	12	12
128C	0	1	-1	1	1
129E	1	4	-3	9	9
130E	2	2	1	2	2
131A	0	0	13	33	33
135A	4	7	3	2	2
136A	-2	2	0	1	1
138E	0	1	1	0	0
141E	-3	4	-1	5	5
142E	0	0	-1	1	1
142F	1	1	0	1	1
145A	0	0	-1	1	1
148A	-1	2	0	1	1
152A	-1	2	0	1	1
153A	5	13	0	1	1
153C	0	1	1	0	0
155C	1	0	0	2	2
155D	0	2	1	1	1
156E	1	1	0	1	1
158D	0	1	0	4	4
158E	-1	4	-1	4	4
160D	-1	4	2	0	0
162K	2	0	1	0	0
163A	1	0	0	2	2
166A	0	2	2	1	1
170A	2	1	2	4	4
171A	2	4	2	1	1
172A	2	1	7	2	2
175A	7	2	-3	12	12
175C	-3	12	1	2	2
176A	1	2	2	1	1
184B	2	1	0	1	1
184C	0	1	0	2	2
185A	0	2	3	2	2
185B	3	2	4	12	12
185D	4	12	-1	1	1
189A	-1	1	-3	9	9
189C	-3	9	1	2	2
190C	1	2	13	33	33
190D	13	33	3	2	2
192Q	3	2	0	1	1
196A	0	1	1	0	0
197A	1	0	-1	5	5
198I	-1	5	-1	1	1
200C	-1	1			

TABLE 3

For each isogeny class of curves in Table 1, and for each prime less than 100, we list the eigenvalues a_p of the Hecke operators T_p for p not dividing N , and the eigenvalues $a_q = \pm 1$ of the involutions W_q for prime q dividing N . [For q dividing N , the entry in the table has been written + or - rather than +1 or -1.] Accordingly, the differential on $H/\Gamma_0(N)$ corresponding to the curve is $f(z)dz$, where $f(z)$ has Fourier expansion $\sum a_n e^{2\pi i n z}$ with

$$\sum_{n=1}^{\infty} a_n n^{-s} = \prod_{p \nmid N} (1 - a_p p^{-s} + p^{1-2s})^{-1} \prod_{q \parallel N} (1 - a_q q^{-s})^{-1}$$

The column headed "P" contains the eigenvalue of W_N in the few cases where N is a prime exceeding 100.

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P	
11B	-2	-1	1	-2	-	4	-2	0	-1	0	7	3	-8	-6	8	-6	5	12	-7	-3	4	-10	-6	15	-7	11B	
14C	+1	-2	0	-	0	-4	6	2	0	-6	-4	2	6	8	-12	6	-6	8	-4	0	2	8	-6	-6	-10	14C	
15C	-1	0	-	0	-4	-2	2	4	0	-2	4	-10	10	4	8	-10	-4	-2	12	-8	10	0	12	-6	-10	15C	
17C	-1	0	-2	4	0	-2	-	-4	4	6	4	-2	-6	4	0	6	-12	-10	4	-4	6	12	-4	10	2	17C	
19B	0	-2	3	-1	3	-4	-3	-	0	6	-4	2	-6	-1	-3	12	-6	-1	-4	6	-7	8	12	12	8	19B	
20B	-1	-	+	2	0	-2	-6	4	6	6	-4	2	6	-10	-6	6	12	2	2	-12	2	8	6	-6	2	20B	
21B	-	-	-2	0	4	-2	-6	4	0	-2	0	6	2	-4	0	6	12	-2	4	0	-6	-16	-12	-14	18	21B	
24B	-	+	-2	0	4	-2	2	-4	-8	6	8	6	-6	6	0	-2	4	-2	-4	8	10	-8	-4	-6	2	24B	
26D	+	-3	-1	1	-2	4	-3	6	-4	2	4	3	0	-5	13	12	-10	-8	-2	-5	-10	-4	0	6	14	26D	
26B	-	+	1	-3	-1	6	-	-3	2	0	6	-4	-7	0	-1	3	0	-6	8	14	-3	2	8	12	-6	-10	26B
27B	0	-	0	-1	0	5	0	-7	0	0	-4	11	0	8	0	0	0	-1	5	0	-7	17	0	0	-19	27B	
30A	+	-	+	-4	0	2	6	-4	0	-6	8	2	-6	-4	0	-6	0	-10	-4	0	2	8	12	18	2	30A	
32B	-	0	-2	0	0	6	2	0	0	-10	0	-2	10	0	0	14	0	-10	0	0	-6	0	0	10	18	32B	
33B	1	-	-2	4	-	-2	-2	0	8	-6	-8	6	-2	0	8	6	-4	6	-4	0	-14	-4	12	-6	2	33B	
34A	-	-2	0	-4	6	2	+	-4	0	0	-4	-4	6	8	0	-6	0	-4	8	0	2	8	0	-6	14	34A	
35B	0	1	+	-	-3	5	3	2	-6	3	-4	2	-12	-10	9	12	0	8	-4	0	2	-1	12	-12	-1	35B	
36A	-	0	0	-4	0	2	0	8	0	-6	-4	-10	0	8	0	0	0	14	-16	-10	-4	0	0	14	36A		
37C	0	1	0	-1	3	-4	6	2	6	-6	4	+	-9	8	3	-3	12	8	-4	-15	11	-10	9	6	8	37C	
37A	-2	-3	-2	-1	-5	-2	0	0	2	6	-4	+	-9	2	-9	1	8	-8	8	9	-1	-4	-15	4	4	37A	
38A	-	-1	-4	3	2	-1	3	+	-1	-5	-8	-2	-8	4	8	-1	15	2	3	2	9	-10	-6	0	-2	38A	
38D	+	1	0	-1	-6	5	3	-	3	9	-4	2	0	8	0	-3	9	-10	5	-6	-7	-10	-6	-12	-10	38D	
39B	1	+	2	-4	4	-2	2	0	4	-10	4	-2	6	-12	0	6	12	-2	-8	0	2	8	4	-2	10	39B	
40B	+	0	-	-4	-4	-2	2	4	8	-2	-8	6	-6	-8	4	6	4	-2	8	0	-6	0	-16	-6	-14	40B	
42A	-	-2	-4	0	-4	6	2	-4	4	-2	0	-10	-6	-4	0	6	4	6	4	8	10	0	-4	-6	-14	42A	
43A	-2	-2	-	0	3	-5	-3	-2	-1	-6	-1	0	5	+	4	-5	-12	2	-3	2	2	-8	15	-4	-7	43A	
44A	-	1	-3	2	4	-4	6	8	3	0	5	-1	0	-10	0	-6	3	-4	-1	15	-4	2	6	-9	-7	44A	
45A	1	+	0	4	4	-2	-2	4	0	2	0	-10	-10	4	-8	10	4	-2	12	8	10	0	-12	6	2	45A	
46A	+	0	-4	0	-2	-2	-2	-2	-	2	0	-4	6	10	0	-4	12	-8	-10	0	6	-12	14	-6	6	46A	
48B	+	0	-2	0	-4	-2	2	4	8	6	-8	-6	-6	-4	0	-2	-4	-2	4	-8	10	8	4	-6	2	48B	
49A	1	0	0	-	4	0	0	0	8	2	0	-6	0	-12	0	-10	0	0	4	16	0	8	0	0	0	49A	
50A	-	-1	+	-2	-3	4	3	5	-6	0	2	-2	-3	4	-12	-6	0	2	13	12	-11	-10	9	15	-2	50A	
50E	+	1	-	-4	-3	-1	+	-1	9	6	2	-4	-3	-7	-6	-6	6	8	-4	12	2	-10	-9	15	2	50E	
51A	0	-	3	-4	-2	-2	+	6	-6	8	2	10	-6	-6	4	-2	6	-10	-2	10	2	-4	-6	0	-16	51A	
52B	-	0	2	-2	-2	+	6	-6	7	2	10	-6	-6	4	-2	6	-10	-2	10	10	2	-4	-6	-6	2	52B	
53A	-1	-3	0	-4	0	-3	-3	-5	7	-7	4	5	6	-2	-2	+	-2	-8	-12	1	-4	-1	-14	1	53A		
54A	-	+	-3	-1	3	-4	0	2	6	-6	5	2	6	-10	-6	-9	-12	8	14	0	-7	8	3	18	-1	54A	
54E	+	-	3	-1	-3	-4	0	2	-6	6	5	2	-6	-10	6	9	12	8	14	0	-7	8	-3	-18	-1	54E	
55B	1	0	-	0	+	2	6	-4	4	6	-8	-2	2	4	-12	-2	4	-10	-16	8	14	8	-4	10	10	55B	
56A	+	2	-4	-	0	0	-2	-2	8	2	4	-6	-2	8	-4	-10	6	4	-12	0	-14	-8	6	10	-2	56A	
56C	-	0	2	+	-4	2	-6	8	0	6	8	-2	2	-4	-8	6	0	-6	-4	-8	10	16	8	-6	-6	56C	
57B	1	-	-2	0	0	6	-6	+	4	2	8	-10	-2	-4	12	-6	-12	-2	-4	0	10	0	16	-2	10	57B	
57F	-2	-	1	3	-3	-6	3	+	4	-10	2	8	-8	-1	3	-6	0	7	8	12	-11	0	4	10	-2	57F	
57E	-2	+	-3	-5	1	2	-1	+	-4	-2	-6	0	0	-1	-9	10	-8	-1	8	-12	-11	16	12	-6	-10	57E	
58B	-	-1	1	-2	-3	-1	8	0	4	+	+	-3	8	2	-11	13	-11	0	-8	-12	2	4	15	4	-10	-2	58B
58A	+	-3	-3	-2	-1	3	-4	-8	0	+	-3	-8	-2	7	11	1	-4	+	-4	-2	-12	-7	0	-6	-6	58A	
61A	-1	-2	-3	1	-5	1	4	-4	-9	-6	0	8	5	-8	4	6	9	+	-7	-8	-11	3	4	-4	-14	61A	
62A	-	0	-2	0	0	-2	-6	4	8	2	+	10	-6	-8	-8	-6	-12	-6	-12	8	10	-8	8	-6	2	62A	
63A	1	0	2	+	0	-2	6	0	0	2	0	6	-2	4	0	-6	-12	-2	4	0	-6	-16	12	14	18	63A	
64B	-	0	2	0	0	-6	2	0	0	10	0	2	10	0	0	-14	0	10	0	0	-6	0	0	10	18	64B	
65A	-1	-2	+	-4	2	+	2	-6	-6	2	-10	-2	-6	10	4	2	6	2	-4	6	-6	-12	-16	2	-2	65A	

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P	
66E	-	+	2	-4	+	-6	2	4	4	6	0	6	-6	4	-12	2	12	-14	4	-12	-6	-4	4	10	-14	66E	
66A	+	-	0	2	+	-4	-6	-4	6	6	8	-10	6	8	-6	0	0	8	-4	6	2	14	-12	-6	14	66A	
66I	-	-	-4	-2	-	4	-2	0	-6	10	-8	-2	2	4	-2	4	0	-8	-12	2	-6	10	4	10	-2	66I	
67A	2	-2	-2	-2	-4	4	3	7	9	-5	-10	-1	0	-2	-1	10	9	-2	-	0	-7	-8	4	7	0	67A	
69A	1	-	0	-2	4	-6	4	2	+	2	4	2	2	2	10	0	-12	-12	-6	-10	-8	14	10	12	-16	-10	69A
70A	+	0	+	+	4	-2	2	0	0	6	8	-10	2	4	8	-2	-8	-14	-12	-16	2	-8	8	10	2	70A	
72A	+	-	2	0	-4	-2	-2	-4	8	-6	8	6	6	4	4	0	-4	-2	-4	-8	10	-8	4	6	2	72A	
73B	1	0	2	2	-2	-6	2	8	4	2	-2	-6	6	-2	6	10	-6	-14	8	0	-	-4	-14	-6	-10	73B	
75E	1	-	+	0	-4	2	-2	4	0	-2	0	10	10	-4	-8	10	-4	-2	-12	-8	-10	0	-12	-6	-2	75E	
75A	2	+	-	-3	2	1	2	-5	6	10	-3	2	-8	1	2	-4	-10	7	-3	-8	-14	0	6	0	17	75A	
75C	-2	-	+	3	2	-1	-2	-5	-6	10	-3	-2	-8	-1	-2	4	-10	7	3	-8	14	0	-6	0	-17	75C	
76A	1	2	-1	-3	5	-4	-3	+	8	-2	4	10	10	12	-1	-4	6	-13	-12	2	9	8	-12	12	-8	76A	
77A	0	1	3	-	+	-4	-6	2	3	-6	5	11	6	8	0	-6	-9	-10	5	9	2	-10	12	-3	-1	77A	
77D	0	-3	-1	+	+	-4	-2	-6	-5	10	-1	-5	-2	-8	8	-6	3	-2	-3	1	10	6	12	-15	-5	77D	
77F	+	+	2	4	-4	-	2	-8	0	6	-4	-2	-10	-4	7	8	-10	4	-2	-16	-8	2	8	12	14	10	77F
78A	-1	-1	-3	-1	-2	3	-6	4	2	-6	-10	-2	-10	4	7	8	-3	-4	8	15	2	+	-6	-7	-19	78A	
79A	-	+	2	-2	0	2	-6	4	-4	6	4	2	6	10	6	-6	-12	-2	-2	12	2	-8	0	-6	-6	79A	
80B	-	+	0	-4	-4	-2	-6	-4	-4	-2	8	6	-6	-8	-4	6	4	-2	-8	0	-6	0	16	-6	-14	80B	
80F	+	+	-2	-4	-4	-2	2	-4	-4	-4	-2	8	6	-6	8	-4	8	-14	-2	8	10	4	12	-14	6	82A	
82A	-	-2	-2	-4	-2	4	-2	6	-8	0	-8	2	+	-12	4	-4	8	-14	-2	8	10	4	12	-14	6	82A	
83A	-1	-1	-2	-3	3	-6	5	2	-4	-7	5	-11	-2	-8	0	6	5	5	-2	2	0	14	+	0	-8	83A	
84A	-	+	4	+	2	-6	-4	-4	2	-2	0	2	12	-4	12	-6	-8	6	-8	14	-2	12	-4	0	-2	84A	
84C	-	-	0	-	-6	2	0	-4	6	-6	8	2	10	4	12	-10	8	-14	8	-2	-14	-4	4	6	2	84C	
85A	1	2	-3	-2	+	0	-6	4	1	-8	-7	-1	4	6	-8	2	-1	-4	-5	3	16	2	-2	15	-7	85A	
88A	1	2	-2	2	-4	2	6	-2	2	-6	6	10	-6	2	12	-6	-10	-6	12	4	10	-12	-6	-	-18	88A	
89A	-1	-1	-1	-4	-2	2	3	-5	7	0	-9	2	0	-7	-12	-3	4	12	-10	7	-6	12	-	+	9	89A	
89C	-	+	-	-4	0	2	-6	-4	0	-6	8	2	6	0	-4	6	0	-10	-4	0	2	8	-12	-18	2	89C	
90E	-	+	-	-2	6	-4	-6	-4	0	-6	-4	8	0	8	0	-6	6	2	-4	-12	-10	-4	12	12	2	90E	
90M	+	-	-	-	2	-6	-4	-4	0	-6	-4	8	0	8	0	-6	6	2	-4	-12	-10	-4	12	12	2	90M	
90A	-	+	+	2	-6	-4	6	-4	0	6	-4	8	0	8	0	6	-6	2	-4	12	-10	-4	-12	-12	2	90A	
91B	0	-2	-3	-	0	-	-6	-7	3	-9	5	2	-6	-1	3	-9	0	-10	14	-6	11	-1	3	15	-1	91B	
91A	-2	0	-3	+	-6	+	4	5	3	-5	-3	4	-6	-1	7	-9	8	-10	-6	-8	-13	3	15	3	7	91A	
92A	-	1	0	2	0	-1	-6	2	+	-3	5	8	3	8	9	6	-12	14	8	-15	-7	-10	6	0	-10	92A	
92C	-	-3	-2	-4	2	-5	-4	-2	-	-7	-3	2	-9	-8	9	2	0	-2	14	-3	-3	-6	8	12	0	92C	
94A	+	0	0	0	2	-4	-2	-2	4	4	4	2	6	6	+	2	12	2	4	-16	-6	-4	-16	-10	-14	94A	
96F	+	+	2	4	-4	-2	-6	-4	0	2	-4	-2	2	-4	-8	10	4	6	-4	16	-6	-4	12	10	-14	96F	
96B	+	+	2	4	-4	-2	-6	-4	0	2	-4	-2	2	-4	-8	10	4	6	-4	16	-6	-4	12	10	-14	96B	
98B	+	2	0	-	0	4	-6	-2	0	-6	4	2	-6	8	12	6	6	-8	0	-2	8	6	6	10	10	98B	
99C	-	-	-1	-2	+	-2	2	0	1	0	7	3	8	-6	-8	6	-5	12	-7	3	-4	-10	6	-15	-7	99C	
99H	-1	-	-	-2	4	+	2	0	-8	6	-8	6	2	0	-8	-6	4	6	-4	0	-14	-4	-12	6	2	99H	
99F	1	+	4	-2	-	-2	-2	-6	-4	6	4	-6	10	6	8	0	-4	-6	8	0	-2	-10	-12	0	2	99F	
99A	-1	+	-4	-2	+	-2	6	-4	-6	-6	4	-6	-2	10	6	6	12	2	-2	-12	-2	8	-6	-6	-2	99A	
100A	-	2	+	-2	0	-2	6	-4	-6	6	-4	-2	6	10	6	6	12	2	2	13	8	-9	-4	14	2	+	100A
101A	0	-2	-1	-2	-2	1	3	-5	1	-4	-9	-2	8	-8	7	-2	-14	8	-4	6	2	-10	12	-18	14	101A	
102A	+	+	0	2	0	0	+	4	6	0	-10	8	-10	-4	12	6	-12	8	-4	-12	-6	2	10	-12	-2	6	102A
102E	+	-	-	-2	0	-6	+	4	-6	-4	-6	-4	-10	-4	9	-2	12	-4	-12	-6	2	10	-12	-2	6	102E	
102G	-	-	-2	0	-4	-2	-	4	0	-10	8	-2	10	12	0	6	12	-10	-12	0	10	-8	4	-6	-14	102G	
104A	-	1	-1	5	-2	+	-3	-2	4	-6	-4	11	8	-1	9	-12	6	4	6	7	-2	12	-16	-10	-10	104A	
105A	1	-	-	-	0	-6	2	-8	8	-2	4	-2	-6	4	8	10	4	-2	4	-12	-2	8	-4	-6	-13	105A	
106B	-	-2	3	2	-3	-4	3	-4	-9	6	5	-10	6	-1	0	+	15	-10	-4	4	12	11	-6	9	-13	106B	

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P
106D	+	2	1	-2	5	-4	3	-4	-3	-6	7	-6	2	7	4	-	7	2	16	12	-12	-7	-14	17	3	106D
106A	+	-1	-4	0	-4	1	5	-7	1	5	-4	1	-10	-10	-6	+	4	4	-4	15	-8	1	-3	17	3	106A
106E	-	1	0	-4	0	5	-3	-1	3	9	-4	5	6	-10	6	+	6	8	-4	-3	-4	-13	3	18	-7	106E
108A	-	1	0	5	0	-7	0	-1	0	0	-4	-1	0	8	0	0	0	-13	11	0	17	-13	0	0	5	108A
109A	+	1	0	3	2	1	0	-8	-5	7	-5	7	2	-4	9	12	-5	-12	-6	-3	-5	8	-2	1	1	-
110E	+	1	+	5	+	2	3	-7	-6	-3	7	-7	6	8	6	-3	-6	-1	8	3	-2	-10	-6	9	-4	110E
110A	-	1	+	-1	+	2	-3	-1	6	-9	5	5	-6	8	6	9	6	5	8	-9	-10	14	-6	-15	8	110A
110C	-	-1	-	3	-	-6	-7	5	-6	5	-3	3	2	4	-2	-1	-10	7	8	7	14	10	-6	-15	-12	110C
112E	-	2	0	+	0	-4	6	2	0	-6	4	2	6	-8	12	6	8	4	4	0	2	-8	6	-6	-10	112E
112K	+	-2	-4	+	0	0	-2	2	-8	2	-4	-6	-2	-8	4	-10	-6	4	12	0	-14	8	-6	10	-2	112K
112A	+	0	2	-	4	2	-6	-8	0	6	-8	-2	2	4	8	6	0	-6	4	8	10	-16	-8	-6	-6	112A
113B	-1	2	2	0	0	2	-6	6	-6	-6	-4	2	-2	6	6	10	6	2	-6	2	10	-4	-14	-14	-	113B
114A	-	-	0	-4	0	-4	6	-	-6	6	2	-4	6	-4	6	6	-12	14	8	0	14	-10	-12	-6	-10	114A
114E	+	+	0	4	4	0	-2	-	-2	-6	4	-8	10	-12	10	2	4	-10	0	-16	-2	10	-16	-2	-10	114E
114G	-	+	2	0	-4	2	-6	+	-4	-2	4	10	10	4	-4	-10	12	14	-12	8	-6	-4	12	-6	10	114G
115A	2	0	+	1	2	-2	3	-2	-	7	-5	11	1	0	0	11	-13	-8	5	5	6	-12	9	4	-14	115A
116A	-	1	3	-4	3	5	-6	-4	-6	+	5	8	0	-1	-3	3	6	2	8	6	-16	11	6	-12	8	116A
116D	-	2	-2	4	2	2	2	4	4	+	-9	-8	2	10	-2	10	0	10	-12	8	10	-6	16	12	10	116D
116E	-	-3	3	4	-1	-3	2	-4	-6	+	9	-8	-8	-5	-7	-5	-10	10	8	-2	0	-1	6	12	0	116E
117A	-1	-	-2	-4	-4	-	-2	0	0	10	4	-2	-6	-12	0	-6	-12	-2	-8	0	2	8	-4	2	10	117A
118A	+	-1	-3	-1	-2	-2	-2	3	0	-1	10	-12	7	-6	-6	-11	+	-12	10	4	12	-15	-14	4	0	118A
118B	-	1	1	3	-2	-6	-2	-5	4	-5	2	-8	7	-6	-2	9	+	-8	-2	12	4	5	14	0	8	118B
118D	+	2	-2	-3	-1	-3	7	4	4	4	-4	-1	-11	-9	10	0	+	-2	4	-9	-14	11	-13	18	2	118D
118E	+	2	2	-3	1	3	-1	-8	8	-4	-4	-1	5	-9	2	12	-	10	4	15	10	11	-11	-6	14	118E
120A	+	-	+	4	0	-6	-2	4	-8	-6	0	-6	10	-4	8	10	0	6	-4	0	-14	16	12	2	2	120A
120E	2	-1	-	0	-4	6	-6	-4	0	-2	-8	-2	-6	12	8	6	12	14	4	8	-6	-8	-12	10	2	120E
121A	0	-1	1	2	+	-4	2	0	-1	0	7	3	8	6	8	-6	5	-12	-7	-3	-4	10	6	15	-7	121A
121D	0	-1	3	0	+	0	0	0	-9	0	-5	7	0	0	-12	6	-15	0	13	-3	0	0	0	-9	17	121D
121F	1	2	1	-2	-	1	-5	6	2	9	-2	-3	-5	0	2	9	8	6	2	12	-2	-10	6	-9	-13	121F
121H	-1	2	1	2	-	-1	5	-6	2	-9	-2	-3	5	0	2	9	8	-6	2	12	2	10	-6	-9	-13	121H
122A	+	-2	1	-5	-3	-3	0	0	5	6	0	-12	-3	-8	12	-2	-9	+	7	-16	-3	1	-12	12	2	122A
123A	-2	-	-4	-2	-3	-6	3	0	-6	5	7	-7	-	-1	3	-6	0	-3	-2	-3	-11	10	-16	-10	-12	123A
123C	0	+	-2	-4	-5	-4	-5	-2	4	1	-5	-7	+	7	7	-14	-12	-3	-2	3	13	-2	-2	18	-14	123C
124A	-	0	1	3	6	-4	0	-5	-4	2	+	-2	-9	2	4	12	9	12	-12	5	-14	10	2	6	-7	124A
124B	-	-2	-3	-1	-6	2	6	-1	-6	0	-	-10	-9	8	0	0	-3	-10	-4	-15	14	8	6	12	-7	124B
126A	-	-	0	-	0	-4	-6	2	0	6	-4	2	-6	8	12	-6	6	8	-4	0	2	8	6	6	-10	126A
126G	+	-	2	+	4	6	-2	-4	-8	2	0	-10	6	-4	0	-6	4	6	4	-8	10	0	4	6	-14	126G
128G	-	2	2	-4	-2	2	-2	2	4	-6	0	10	-6	-6	-8	-6	14	2	10	12	14	-8	-6	-2	-2	128G
128F	-	-2	2	4	2	2	-2	2	-4	-6	0	10	-6	-6	8	-6	-14	-2	-10	-12	14	8	6	-2	-2	128F
128A	-	2	-2	4	-2	-2	-2	-2	-4	-6	0	-10	-6	-6	8	6	14	-2	10	-12	14	8	-6	-2	-2	128A
128C	+	-2	-2	-4	2	-2	-2	-2	4	6	0	-10	-6	-6	-8	6	-14	-2	-10	12	14	-8	6	-2	-2	128C
129B	1	-	2	0	0	-2	-6	4	-4	-6	8	6	2	+	4	-2	0	14	12	8	2	-8	0	14	-14	129B
129E	0	-	-2	-2	-5	3	-3	2	-1	0	-5	8	-7	+	-8	3	12	-8	-15	-14	12	-16	15	10	11	129E
130A	-	0	-	0	0	-	-2	-8	-4	-2	-6	6	10	0	8	6	8	-2	4	-12	10	-8	12	10	-14	130A
130E	+	-2	-	-4	-6	-	-6	2	6	-6	-2	2	-6	-2	-12	6	2	-4	-6	-10	-4	0	-6	2	-2	130E
130J	-	2	+	-4	-2	+	2	6	6	2	-6	-2	10	-10	-12	2	10	2	-12	10	10	-4	0	-14	14	130J
131A	0	-1	-2	-1	0	-3	4	-2	-2	0	-2	-8	-3	3	10	-9	1	-15	-6	10	4	-8	-4	-11	12	131A
132A	-	-	2	-2	-	-2	4	-2	-8	-8	10	8	-	0	-2	-8	12	10	12	8	6	-2	16	-14	-2	132A
132C	-	+	2	2	+	-	-4	-2	-8	0	-6	0	10	4	0	14	-12	-14	4	0	6	2	16	-14	-2	132C
135A	-2	+	+	-3	-2	-5	-8	1	6	2	0	-5	-10	-10	4	-2	-8	7	-9	2	-5	-3	6	-12	-13	135A

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P	
135B	2	-	-	-3	2	-5	8	1	-6	-2	0	5	10	4	-4	2	8	7	-9	-2	-5	-3	-6	12	-13	135B	
136A	-	2	0	-2	-6	2	-	0	6	-10	-8	6	-6	-8	0	-10	-8	14	4	2	-14	-10	8	-10	2	136A	
136C	-	2	0	0	2	-6	2	0	4	0	-8	-4	6	8	-8	10	0	12	8	12	2	-4	16	10	-18	136C	
138A	+	+	-2	0	0	-2	2	-8	0	-2	-8	2	10	8	8	2	-4	2	8	0	-6	8	-16	18	10	138A	
138E	+	+	-	-2	-6	-2	0	0	0	0	6	8	0	10	-12	-8	2	-12	4	-12	0	-10	-6	14	0	-6	138E
138G	+	-	0	2	0	2	0	2	+	-6	-4	-10	-6	2	0	12	12	-10	14	0	2	-10	0	12	-10	138G	
139A	1	2	-1	3	5	-7	-6	-2	2	9	9	2	-6	-4	8	0	6	4	5	5	-6	-5	7	7	-12	139A	
140A	-	1	-	-	-3	-1	-3	2	-6	-9	8	-10	0	2	-3	0	12	8	8	0	14	5	-12	12	17	140A	
140C	-	3	+	0	-5	-3	-1	6	6	-9	-4	2	-4	10	-1	4	-8	12	8	2	13	-4	4	-13	140C		
141A	-1	-	2	0	-4	-2	2	0	0	-6	-4	-10	-2	8	+	-2	-4	14	-8	16	2	8	-4	18	-14	141A	
141E	-2	-	-3	-3	-5	2	-6	-6	9	1	-2	1	6	2	-	0	-12	-2	2	-2	-2	-15	-4	10	1	141E	
141G	-1	-	0	4	0	-6	2	6	3	3	2	-7	-8	-6	-	2	12	2	-2	0	-10	-4	4	-10	-18	141G	
141H	2	-	-1	-3	1	-2	2	6	3	3	2	-7	10	-10	+	4	8	-10	10	-14	-10	17	8	6	1	141H	
141I	0	+	-1	-3	-3	-4	8	-6	3	-1	4	1	-10	-8	+	10	-10	2	4	-6	-8	-3	-18	-2	5	141I	
142A	+	0	0	2	0	6	4	6	-4	-2	-8	10	-2	-8	-4	0	10	-8	2	-	-2	0	-4	6	14	142A	
142C	+	1	0	-1	0	-1	0	-1	3	0	5	-4	0	0	1	9	6	6	2	8	+	-1	8	12	-3	-16	142C
142E	+	-1	-2	-1	-2	-3	-6	-5	-1	6	1	6	-6	-5	-3	-6	2	-6	-14	+	-17	10	4	9	-6	142E	
142F	-	-3	-4	-3	0	1	0	-5	-7	-8	7	4	4	-5	-13	-6	10	-2	-4	-	7	0	-4	-3	-4	142F	
142G	+	3	2	-3	-6	-5	6	6	7	-2	-3	-11	10	-4	-4	2	-1	-2	-1	-9	-16	8	0	-7	-13	142G	
143A	0	-1	-1	-2	+	+	-4	2	7	-2	-3	-11	10	-4	-4	2	-1	-2	-1	-9	-16	8	0	-7	-13	143A	
144E	+	-	2	0	4	-2	-2	4	-8	-6	-8	6	6	-4	0	2	4	-2	4	8	10	8	-4	6	2	144E	
144A	-	+	0	-2	0	2	0	-8	0	0	4	-10	0	-8	0	0	0	14	16	0	-10	4	0	0	14	144A	
145A	-1	0	+	2	-6	2	-2	-4	2	2	0	2	10	-2	8	-12	-6	-8	2	-12	-6	-10	-14	18	2	145A	
147C	-1	+	2	-	-4	2	6	-4	0	-2	0	6	-2	-4	0	6	-12	2	4	0	6	-16	12	14	-18	147C	
147A	2	+	2	-	-2	-1	0	-1	0	4	-9	3	10	5	6	12	-12	-10	-5	-6	3	-1	-6	-16	6	147A	
147I	2	-	-2	+	-2	1	0	1	0	4	9	3	-10	5	-6	12	-12	10	-5	-6	-3	-1	6	16	-6	147I	
148A	-	-1	-4	-3	5	0	-6	-2	-6	-6	4	-	-9	4	-7	9	-4	-8	-12	3	-5	6	-1	2	0	148A	
150I	-	+	+	4	0	-2	-6	-4	0	-6	8	-2	-6	4	0	6	0	-10	4	0	-2	8	-12	18	-2	150I	
150A	-	-	-	-2	2	-6	-2	0	-4	0	-8	-2	2	4	-8	-6	10	2	8	12	-4	0	-4	-10	-8	150A	
150G	+	+	-	2	2	6	2	0	-4	0	-8	2	2	4	-8	6	10	2	-8	12	-4	0	-4	-10	-8	150G	
151B	+	1	9	3	2	1	-5	+	-1	-3	4	2	-8	-8	-8	9	1	14	13	10	9	-10	10	-12	14	151B	
152A	+	-2	-1	-3	-3	-4	5	+	0	2	8	-10	6	-7	-9	-8	14	-5	0	-6	-15	-4	4	0	16	152A	
153E	1	-	2	0	-2	-	-	-4	-4	-6	2	-4	3	-7	0	-6	12	-10	4	-4	-6	12	4	-10	2	153E	
153A	0	-	-3	-4	3	-1	-	-1	-9	-6	2	-4	3	-7	6	6	-6	8	-4	-12	2	-10	6	0	-16	153A	
153C	-2	+	-1	-2	-3	-5	+	+	-1	-7	6	4	10	9	1	-12	-12	6	2	4	-8	0	-6	4	2	8	153C
153D	2	+	1	-2	3	-5	-	-1	7	-6	4	10	-9	1	12	-12	-6	2	4	8	0	-6	-4	-2	8	153D	
154A	+	2	2	+	-	-4	0	4	4	2	-10	-6	0	-4	10	-14	10	-8	8	-4	4	16	4	10	6	154A	
154C	+	0	-4	+	+	2	-4	-6	4	-2	-2	10	4	-8	2	6	-12	-14	-12	-8	4	0	-6	-6	-14	154C	
154E	-1	0	2	+	4	0	2	0	-8	-2	-8	-2	10	4	8	6	0	10	-12	16	-14	0	0	-6	10	154E	
155A	-1	2	+	4	4	0	2	4	2	-6	-	-4	-6	-6	8	-12	-4	10	8	0	-4	0	2	14	-18	155A	
155C	0	-1	+	0	-4	-6	5	-1	8	-10	+	1	-3	-7	-6	5	11	-12	-2	9	-9	-10	9	0	-14	155C	
155D	-2	-1	-	-2	2	-6	-7	-5	4	0	-	-7	-3	9	-2	9	-5	-8	8	-3	-1	0	-11	10	18	155D	
156A	-	-	0	-2	0	-	-6	2	0	-6	2	2	-12	-4	0	6	12	2	-10	12	14	8	12	0	-10	156A	
156E	-	+	-4	-2	-4	-	2	-2	0	-6	-10	10	8	4	-4	-10	-8	-14	2	16	-10	-16	0	-4	-2	156E	
158B	+	1	3	-1	0	5	0	2	-6	0	-4	2	-12	8	-9	6	-9	8	-4	-9	2	-	18	9	17	158B	
158D	-	-3	-3	-3	-2	-5	6	0	-2	6	-10	-10	2	4	-3	-12	1	0	-11	-6	+	6	-15	1	158D		
158E	-	-3	-3	-3	-2	-5	6	0	-2	6	-10	-10	2	4	-3	-12	1	12	-8	-3	-6	-	14	-7	-11	158E	
158F	-	-2	-2	0	-4	2	-2	0	0	8	8	4	-10	-2	0	-8	14	0	8	8	6	+	12	6	10	158F	
158H	-	-1	1	3	2	-1	-2	0	-6	-10	-2	-2	2	2	3	4	5	12	8	-13	-6	+	-6	-15	13	158H	
160A	-	-2	+	2	4	-6	2	-8	6	-2	4	2	-10	2	2	2	0	2	6	12	10	8	10	-6	10	160A	
160D	+	-2	+	-2	-4	-6	2	8	-6	-2	4	2	-10	-2	-2	2	0	2	-6	-12	10	-8	-10	-6	10	160D	

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P
161B	-1	0	2	-	4	6	-2	4	+	-2	-4	-2	-6	12	-12	-10	0	2	12	8	-14	8	-4	6	-10	161B
162E	-	+	3	-4	0	-1	3	-4	0	-9	-4	-1	-6	8	12	6	0	-1	-4	12	11	-16	3	2	2	162E
162K	-	+	-3	-4	0	-1	-3	-4	0	9	-4	-1	6	8	12	6	0	-1	-4	12	11	-16	3	2	2	162K
162G	-	+	0	2	-3	2	-3	-1	-6	6	-4	-4	9	-1	-6	12	0	8	5	-12	11	-4	12	6	5	162G
162A	+	-	0	2	3	2	3	-1	6	-6	-4	-4	-9	-1	6	-12	-3	8	5	-12	11	-4	-12	-6	5	162A
163A	0	0	-4	2	-6	4	0	-6	6	-4	-4	-8	3	7	1	-9	-2	3	-2	15	-2	-8	-5	-14	-11	163A
166A	-1	-2	1	-5	-2	-2	-3	-2	4	-3	1	1	6	8	12	-14	-3	-7	-2	-14	-4	-6	+	4	12	166A
168B	+	-	2	1	0	-2	6	-2	-4	-6	-8	-10	-10	12	-8	6	4	-10	12	4	2	8	4	6	10	168B
168E	+	+	2	-	0	-6	-2	4	-4	-10	-8	6	-2	-4	8	-10	12	-2	12	-12	-14	-8	-2	-2	10	168E
170A	+	-2	-	-2	-2	-6	-	-8	-2	6	6	2	2	-4	4	-10	0	-10	8	14	10	-14	-4	6	-14	170A
170C	+	3	+	2	-4	-3	-	3	-6	9	-3	-8	-6	6	-13	-9	15	7	-2	9	-3	0	12	-9	7	170C
170D	+	1	-	2	0	5	+	-1	6	-9	-1	-4	-6	2	-9	-9	3	-7	14	3	11	8	0	-9	-7	170D
170F	-	1	+	2	0	-1	+	+	-1	-3	5	8	-10	-3	-3	-3	3	11	2	9	11	8	-12	15	-7	170F
170H	+	-2	+	2	6	2	-	-8	-6	-6	-2	2	6	-4	12	6	0	2	8	-6	2	-10	12	6	2	170H
171A	0	-	-3	-1	0	-4	3	-	0	-6	-4	2	6	-1	3	-12	6	-1	-4	-6	-7	8	-12	-12	8	171A
171D	-1	-	2	0	0	6	6	+	-4	-2	8	-10	2	-4	-12	6	12	-2	-4	0	10	0	-16	2	10	171D
171H	2	-	3	-5	-1	2	1	+	4	2	6	0	0	-1	9	-10	8	-1	8	12	-11	16	-12	6	-10	171H
171I	2	-	-1	3	-3	-6	-3	2	-4	10	2	8	8	-1	-3	6	0	7	8	12	-11	0	-4	-10	-2	171I
172A	-	-2	0	-4	-3	-1	-3	2	-3	6	5	8	-3	-	-12	-9	-12	-10	11	-6	-10	8	-15	0	-1	172A
174A	+	-	2	0	-4	6	-2	4	0	+	-4	-6	6	-12	-8	-6	8	10	-4	-8	2	4	0	14	18	174A
174E	+	+	3	-3	6	0	7	5	-8	-	-8	-3	-5	3	9	-2	-11	-6	0	0	-10	-2	0	10	0	174E
174F	-	+	1	1	6	-4	-7	-3	4	+	0	-7	5	-5	-5	10	3	10	0	-4	10	-6	16	-10	-8	174F
174I	+	-	-3	5	6	-4	3	-1	0	+	-4	-1	-9	-7	-3	-6	-3	-10	-4	12	2	14	0	-6	8	174I
174G	-	-	-1	1	-2	0	-3	-1	-4	-	4	3	-7	9	-1	-2	-3	6	12	16	-10	10	0	6	0	174G
175C	0	-1	+	-	-3	-5	-3	2	-6	3	-4	-2	-12	10	-9	-12	0	8	4	0	-2	-1	-12	-12	1	175C
175B	-2	-1	-	-	-3	-1	-7	0	-6	-5	2	-2	2	4	3	-6	10	-8	-2	-8	-6	-5	4	0	-7	175B
175F	-2	1	-	+	-3	1	7	0	6	-5	2	2	2	-3	6	10	-8	-8	2	-8	6	-5	-4	0	7	175F
176D	-	1	1	2	+	4	-2	0	1	0	-7	3	-8	6	-8	-6	12	7	3	4	10	6	15	-7	-7	176D
176A	-	-1	-3	-2	+	-4	6	-8	3	0	-5	-1	0	10	0	-6	-3	-4	1	-15	-4	-2	-6	-9	-7	176A
176C	+	3	-3	2	-	0	-6	-4	-1	-8	7	-1	4	-6	8	2	1	4	5	-3	16	-2	2	15	-7	176C
178A	-	1	3	-4	-6	2	3	5	-3	0	5	-10	0	-1	12	9	12	-10	-4	-6	-1	-10	-12	+	17	178A
178C	+	2	0	0	4	-1	2	-2	8	0	0	0	-10	-2	-8	6	10	-4	-8	8	-2	8	14	-	-2	178C
179A	-	0	3	-4	0	-4	1	-3	6	3	-8	2	12	-11	1	0	-5	14	-9	0	10	10	17	-1	-14	179A
180A	-	-	-	-	0	2	6	-4	-6	-6	-4	2	-6	-10	6	6	-12	2	2	12	2	8	-6	6	2	180A
182A	-	1	0	-	-3	-	0	2	-3	0	5	-7	3	8	-3	-12	6	-1	5	12	11	-1	12	-18	17	182A
182D	-	-	3	+	1	+	0	-6	-7	-4	7	9	-3	4	7	0	-10	1	1	16	5	11	0	-6	-1	182D
182E	-	0	-	+	4	+	-6	0	8	-10	-8	6	-6	4	-8	6	8	10	4	-8	2	8	0	18	2	182E
182I	+	3	0	-	-5	+	-4	2	5	4	1	7	-9	-12	-7	-4	-6	13	11	0	7	-17	4	14	5	182I
182J	+	1	4	+	-1	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182J
184A	+	3	0	-2	0	-5	-6	6	-	9	3	-8	3	-8	7	-2	4	-10	8	7	9	-6	-14	16	6	184A
184B	+	-1	-2	-4	-2	7	-4	-6	+	5	3	2	-9	8	-1	-6	-8	-10	2	-13	-3	6	0	-4	-8	184B
184C	-	0	-4	4	-6	-2	6	-6	-	-6	-	0	-8	6	-2	-8	4	-4	-4	-5	-15	-6	6	-8	10	184C
184D	0	-1	-	-3	-5	4	-4	-8	4	4	2	-	-5	-6	9	3	-8	-10	-4	-8	5	-14	11	-2	10	184D
185A	1	-2	+	-2	0	-2	2	-4	-2	2	-6	+	10	-4	-10	-6	0	2	-14	0	2	-6	18	2	-10	185A
185B	-2	1	+	+	-5	3	-4	-4	-2	-2	0	+	7	-4	11	-3	0	-4	16	-15	11	-12	-3	-4	8	185B
186A	-	-	-	-3	-2	5	-7	1	4	-8	+	-6	-2	-10	-1	6	-10	1	-3	3	14	-11	7	-6	-3	186A
186B	-	-	1	-2	-3	-1	3	-5	4	0	-	-2	2	-6	-7	14	10	7	-7	-3	7	-10	-1	10	13	186B
186D	+	+	-1	2	3	3	1	7	0	4	-	-10	-6	6	-5	-2	6	3	-3	7	-10	-1	17	6	5	186D
187A	0	1	3	2	-	2	+	2	-3	-6	-7	-7	12	-10	0	6	-3	8	-7	-9	2	8	6	15	11	187A

	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	P
187C	-2	0	4	-5	+	4	-	2	-2	-3	4	-2	-3	-2	3	9	-3	-10	7	2	-3	0	14	1	-10	187C
189A	-2	+	-1	+	4	-2	3	-8	-6	-4	6	-3	-3	1	9	6	-15	4	-8	-12	6	-1	-9	2	12	189A
189B	2	-	1	+	4	-2	-3	-8	6	4	6	-3	-1	11	-9	-6	15	4	-8	12	6	-1	9	-2	12	189B
189F	0	+	3	-	6	-4	3	2	-6	-6	-4	-7	-3	-1	9	-6	9	-10	-4	0	2	-1	3	6	-10	189F
189C	0	-	-3	-	-6	-4	-3	2	6	6	-4	-7	3	-1	-9	6	-9	-10	-4	0	2	-1	-3	-6	-10	189C
190A	-	1	-	-1	0	-1	-3	-	3	-3	2	-10	6	2	0	3	3	8	-7	12	-13	14	6	6	-10	190A
190C	+	-1	+	-1	0	-3	-7	+	-5	-5	10	2	2	6	0	9	-7	-4	7	0	-9	-10	-2	-10	-18	190C
190D	-	-3	+	-5	-4	-1	-3	-	7	-3	-2	-2	-6	6	0	-13	-9	-12	-3	0	11	-2	10	2	-2	190D
192E	-	+	2	0	4	2	2	-4	8	-6	-8	-6	-6	4	0	2	4	2	-4	-8	10	8	-4	-6	2	192E
192K	+	-	2	0	-4	2	2	4	-8	-6	8	-6	-6	-4	0	2	-4	2	4	8	10	-8	4	-6	2	192K
192A	+	-	-2	4	4	2	-6	-4	0	-2	-4	2	2	4	-8	-10	-4	-6	4	16	-6	-4	12	10	-14	192A
192G	+	+	-2	-4	-4	2	-6	4	0	-2	4	2	2	-4	8	-10	4	-6	-4	-16	-6	4	-12	10	-14	192G
194A	-1	0	4	-	4	-4	6	-6	-4	0	0	-8	-2	-8	0	6	6	10	6	0	-10	8	-2	14	+	194A
195A	-	-	-	0	4	-	2	-4	8	-2	-8	6	-6	-4	-8	6	-12	-2	-4	0	-6	16	-4	10	18	195A
195I	2	-	-	-3	-5	-	5	-2	-1	10	-2	-3	-9	-4	10	9	0	-11	-4	15	6	-11	8	-11	-9	195I
195J	2	+	-	-3	-1	+	-1	-2	-3	-2	-6	11	-5	4	-10	11	8	13	12	-5	10	-3	-12	-15	17	195J
195K	2	-	+	-1	5	+	-7	-6	3	2	2	7	9	-8	10	5	0	5	-4	9	-6	-3	-4	11	-11	195K
196A	-	-1	-3	-	-3	-2	-3	1	3	-6	7	-1	-6	-4	9	3	-9	1	-7	0	1	-13	-12	-15	10	196A
196C	-	1	3	+	-3	2	3	-1	3	-6	-7	-1	6	-4	-9	3	9	-1	-7	0	-1	-13	12	15	-10	196C
197A	-2	0	0	-3	4	-2	-8	-3	-3	7	-10	7	9	1	-11	10	0	5	-10	8	6	2	-7	-8	-2	197A
198I	+	-	-2	-4	-	-6	-2	4	-4	-6	0	6	6	4	12	-2	-12	-14	4	12	-6	-4	-4	-10	-14	198I
198E	-	-	0	2	-	-4	6	-4	-6	-6	8	-10	-6	8	6	0	0	8	-4	-6	2	14	12	6	14	198E
198Q	+	-	4	-2	+	4	2	0	6	-10	-8	-2	-2	4	2	-4	0	-8	-12	-2	-6	10	-4	-10	-2	198Q
198A	+	+	0	2	-	2	6	2	0	6	-4	2	-6	-10	-12	12	-12	-10	8	-12	14	2	12	0	2	198A
198M	-	0	+	0	4	2	-2	4	0	-6	-2	-6	-6	8	-4	-6	-4	-2	-8	12	14	2	-12	0	2	198M
200G	-	0	+	4	4	2	-2	4	-4	-2	-8	-6	-6	8	-4	-6	-4	-2	-8	0	6	0	16	-6	14	200G
200A	-	3	+	-2	1	-4	-5	1	2	-8	10	6	-3	-4	-4	-6	8	10	1	-12	-3	6	13	-9	14	200A
200B	+	-3	-	2	1	4	5	1	-2	-8	10	-6	-3	4	4	6	8	10	-1	-12	3	6	-13	-9	-14	200B
200C	-	-2	-	-2	-4	-4	0	-4	2	2	0	-4	2	6	6	4	-12	-10	-14	8	-8	16	-2	6	-16	200C
200E	+	2	-	2	-4	4	0	-4	-2	2	0	4	2	-6	-6	-4	-12	-10	14	8	8	16	2	6	16	200E

TABLE 4

In this pair of tables, all curves with conductor of the form $2^a 3^b$ are described. Every such curve has a model of the shape

$$Dy^2 = x^3 - 3Xx - 2Y \quad (1)$$

where D is $\pm 1, \pm 2, \pm 3$ or ± 6 , and (X, Y) is a "primitive" integer solution of

$$X^3 - Y^2 = \pm 2^A 3^B; \quad (2)$$

in this context, "primitive" means that $Y \geq 0$ and there is no integer $t \geq 2$ such that $t^2 | X$ and $t^3 | Y$.

In Table 4a we list all the 98 primitive solutions X, Y, A, B of (2), and label them by the numbers from 1 to 98; if now (X, Y) is the M^{th} solution of (2), we denote the curve (1) by M^*D . In Table 4b the curves M^*D are sorted according to conductor and isogeny class; the first columns list M^*D , the next set of columns give $\Delta = \pm 2^a 3^b$, listing $\pm a b$, and the final two sets of columns contain the Kodaira symbols corresponding to the primes 2, 3 respectively. Isogenous sets of curves are bracketed together, with a number to denote the nature of the isogeny, and "CM" if there is complex multiplication.

The isogenies and examples of complex multiplication are all predictable. Using the conventions of Table 1, they are described by the pictures overleaf; k may be any element of $\mathbb{Q}^\times / \mathbb{Q}^{\times 2}$.

(1) Cases with complex multiplication by $\frac{1}{2}(1+\sqrt{-3})$.

$$\begin{array}{ccc}
 77^*k \xrightarrow{3} 1^*k \xrightarrow{3} 1^*-3k \xrightarrow{3} 77^*-3k & & 2^*k \xrightarrow{3} 2^*-3k \\
 3^*k \xrightarrow{3} 3^*-3k & 4^*k \xrightarrow{3} 4^*-3k & 5^*k \xrightarrow{3} 5^*-3k \\
 6^*k \xrightarrow{3} 6^*-3k & \begin{array}{c} 2 \\ | \\ 39^*2k \end{array} & 7^*k \xrightarrow{3} 7^*-3k \\
 8^*k \xrightarrow{3} 8^*-3k & \begin{array}{c} 2 \\ | \\ 39^*-6k \end{array} & 9^*k \xrightarrow{3} 9^*-3k
 \end{array}$$

The curves 77 and 39 have complex multiplication respectively by $\mathbb{Z}[\frac{1}{2}(1+\sqrt{-27})]$ and $\mathbb{Z}[\sqrt{-3}]$; the rest have complex multiplication by $\frac{1}{2}(1+\sqrt{-3})$.

(2) Other cases with complex multiplication.

$$\begin{array}{ccc}
 \begin{array}{c} 29^*2k \\ | \\ 30^*k \\ / \quad \backslash \\ 73^*k \quad 73^*-k \end{array} & \begin{array}{cc} 10^*k \xrightarrow{2} 11^*2k \\ 41^*k \xrightarrow{2} 42^*2k \end{array} & \begin{array}{cc} 18^*k \xrightarrow{2} 19^*2k \\ 55^*k \xrightarrow{2} 55^*-2k \end{array}
 \end{array}$$

The curves 73 and 55 have complex multiplication respectively by $2i$ and $\sqrt{-2}$; the rest have multiplication by i .

(3) Cases without complex multiplication.

$$\begin{array}{ccc}
 \begin{array}{ccc} 50^*2k & & 92^*-k \\ & \searrow \quad \nearrow & \\ & 60^*k & \text{---} 94^*-k \\ & \nearrow \quad \searrow & \\ 87^*k & & 97^*-k \end{array} & & \begin{array}{ccc} 69^*k & & \\ | & & \\ 46^*k & \text{---} & 61^*-2k \\ / \quad \backslash & & \\ 85^*k & & 61^*-2k \end{array} \\
 \begin{array}{cc} 27^*k \xrightarrow{2} 48^*2k & 40^*k \xrightarrow{2} 54^*2k \\ 57^*k \xrightarrow{2} 91^*2k & 22^*k \xrightarrow{2} 33^*-2k \end{array} & & \begin{array}{cc} 93^*k \xrightarrow{2} 96^*2k & \\ 68^*-k \xrightarrow{3} 82^*3k & \\ 64^*+k \xrightarrow{3} 79^*3k & \end{array} \\
 \begin{array}{cc} 80^*-k \xrightarrow{3} 47^*k \xrightarrow{3} 65^*3k & \\ 35^*k \xrightarrow{3} 62^*3k & 58^*-k \xrightarrow{3} 71^*3k \end{array} & & \\
 \begin{array}{cc} 72^*-k \xrightarrow{3} 78^*3k & 89^*-k \xrightarrow{3} 90^*3k \\ 63^*k \xrightarrow{7} 83^*-k & 28^*k \xrightarrow{5} 98^*-k \\ \begin{array}{c} 3 \\ | \\ 70^*3k \end{array} & \begin{array}{c} 3 \\ | \\ 76^*-3k \end{array} & \begin{array}{c} 2 \\ | \\ 67^*2k \end{array} & \begin{array}{c} 2 \\ | \\ 95^*-2k \end{array} \end{array}
 \end{array}$$

TABLE 4a : Solutions of $X^3 - Y^2 = \pm 2^A 3^B$

	X	Y		A	B					
1	0	1	-	0	0	50	-8	28	-	4 4
2	0	2	-	2	0	51	9	9	+	3 4
3	0	3	-	0	2	52	9	21	+	5 2
4	0	4	-	4	0	53	9	45	-	4 4
5	0	6	-	2	2	54	10	26	+	2 4
6	0	9	-	0	4	55	10	28	+	3 3
7	0	12	-	4	2	56	10	32	-	3 1
8	0	18	-	2	4	57	10	136	-	3 7
9	0	36	-	4	4	58	12	36	+	4 3
10	-1	0	-	0	0	59	12	42	-	2 2
11	1	0	+	0	0	60	13	35	+	2 5
12	-1	1	-	1	0	61	13	46	+	0 4
13	1	2	-	0	1	62	13	47	-	2 1
14	1	3	-	3	0	63	-15	9	-	7 3
15	1	5	-	3	1	64	-15	183	-	12 2
16	1	7	-	4	1	65	17	71	-	7 0
17	1	17	-	5	2	66	18	72	+	3 4
18	-2	0	-	3	0	67	22	100	+	3 4
19	2	0	+	3	0	68	-23	11	-	12 1
20	-2	1	-	0	2	69	-23	73	-	3 7
21	-2	2	-	2	1	70	25	131	-	9 1
22	2	2	+	2	0	71	28	148	+	4 1
23	2	3	-	0	0	72	33	177	+	9 2
24	-2	4	-	3	1	73	33	189	+	3 3
25	2	4	-	3	0	74	46	312	-	3 0
26	-2	8	-	3	2	75	8158	736844	-	3 1
27	-2	10	-	2	3	76	505	23053	-	27 1
28	-2	44	-	3	5	77	40	253	-	0 2
29	-3	0	-	0	3	78	57	429	+	7 2
30	3	0	+	0	3	79	105	1077	-	8 2
31	-3	3	-	2	2	80	73	827	-	15 2
32	3	3	+	1	2	81	366	7002	-	2 3
33	3	5	+	1	0	82	33	207	-	8 3
34	3	6	-	0	2	83	5745	435447	-	13 3
35	-3	9	-	2	3	84	54	396	+	3 4
36	3	9	-	1	3	85	97	955	+	3 4
37	4	4	+	4	1	86	1809	76941	+	3 4
38	4	10	-	2	2	87	193	2681	+	4 4
39	5	11	+	2	0	88	72	612	-	4 4
40	-5	19	-	1	5	89	153	963	+	15 4
41	-6	0	-	3	3	90	657	16839	+	9 4
42	6	0	+	3	3	91	70	584	+	3 5
43	6	12	+	3	2	92	1153	39151	+	5 5
44	6	15	-	0	2	93	106	1090	+	2 6
45	6	18	-	2	3	94	73	595	+	4 7
46	7	10	+	0	5	95	1942	85580	+	3 8
47	-7	13	-	9	0	96	19	215	-	1 9
48	7	17	+	1	3	97	-47	2359	-	5 11
49	7	19	-	1	2	98	478	11044	-	3 13

TABLE 4b[illegible]

40*-3	- 7 2	II	12)2	41* 3	256	III}2 CM i	64*-1	486	16	II}3
54*-6	+ 14 1	III*	11)	42* 6	- 9 0	III*	79*-3	- 6 5	12	IV*}3
40*-6	- 13 2	I*2	12)2	41* 6	+ 15 0	III*}2 CM i	64* 3	- 2 11	16	IV*}3
54*-3	+ 8 1	III	11)	42* 3	- 15 0	III	79* 1	- 6 11	12	II
40* 3	- 7 2	II	12)2	55*-3	+ 9 0	III}2 CM i	72*-3	- 2 5	13	IV*}3
54* 6	+ 14 1	III*	11)	55* 6	+ 15 0	III*	78* 1	+ 3 11	11	II}3
40* 6	- 13 2	I*2	12)2	55*-6	+ 15 0	III*}2 CM i	72* 1	+ 1 5	13	II}3
54* 3	+ 8 1	III	11)	55* 3	+ 9 0	III	78*-3	+ 3 5	11	IV*}3
93*-3	+ 8 3	III	13)2	10* 1	288	III}2 CM	89*-1	+ 1 11	19	IV}3
96*-6	- 13 6	I*2	16)	11* 2	+ 12 3	III*	90* 3	+ 9 7	13	II*}3
93*-6	+ 14 3	III*	13)2	10* 3	- 6 9	III*}2 CM	89* 3	+ 3 13	19	II*}3
96*-3	- 7 6	II	16)	11* 6	+ 12 9	III*	90*-1	+ 9 13	13	IV
93* 3	+ 8 3	III	13)2	29* 2	- 12 6	I*0		+ 3 7		
96* 6	- 13 6	I*2	16)	30* 1	+ 6 6	III				
93* 6	+ 14 3	III*	13)2	73* 1	+ 9 6	I*0				
96* 3	- 7 6	II	16)	73*-1	+ 9 6	I*0				
	432			46*-1	+ 6 8	III				
1*-6	- 12 9	II*	IV*}2 CM	61* 2	+ 12 7	I*3				
1* 2	- 12 3	II*	II}2 CM	69*-1	- 9 10	I*0				
77*-6	- 12 11	III*	II*}3 CM	85*-1	+ 9 7	I*0				
77* 2	- 12 5	II*	IV*}3 CM	46* 1	+ 6 8	III				
2*-3	- 8 9	I*0	II	61*-2	+ 12 7	I*3				
2* 1	- 8 3	I*0	II	69* 1	- 9 10	I*0				
17*-1	- 11 5	I*3	IV	85* 1	+ 9 7	I*0				
17* 3	- 11 11	I*3	IV	35*-3	324	IV*				
38*-3	- 8 11	I*0	II*	62*-1	- 8 12	IV*				
38* 1	- 8 5	I*0	IV	35* 1	- 8 4	IV*				
47*-1	- 15 3	I*7	II}9	62* 3	- 8 6	IV*				
60* 1	- 21 5	I*13	IV	58*-2	- 8 10	IV				
65*-3	- 13 9	I*5	IV*	71* 6	+ 4 6	IV				
47* 3	- 15 9	I*7	IV*	58* 6	+ 4 10	IV				
60*-3	- 21 11	I*13	II*}9	71*-2	+ 4 12	IV				
65* 1	- 13 3	I*5	II		+ 4 4	IV				

576	4*-1	- 10 3	I*0	III	III	6	28*-3	- 9 2	III	12	5*-3	972	IV*)3
	39*-2	+ 14 3	I*4	III	III	6	67*-6	+ 15 1	III*	11	5* 1		II
	4* 3	- 10 9	I*0	III*	III*	cm	95* 6	+ 15 5	III*	15	7*-6		IV*)3
	39* 6	+ 14 9	I*4	III*	III*		98* 3	- 9 10	III	110	7* 2		II
	4*-3	- 10 9	I*0	III*	III*		28*-6	- 15 2	III*	12	8*-1		IV*)3
	39*-6	+ 14 9	I*4	III*	III*	6	67*-3	+ 9 1	III	11	8* 3		II*)cm
	4* 1	- 10 3	I*0	III	III	cm	95* 3	+ 9 5	III	15	9*-2		IV
	39* 2	+ 14 3	I*4	III	III		98* 6	- 15 10	III*	110	9* 6		IV*)3
	10* 2	- 12 3	I*2	III	III	2	28* 3	- 9 2	III	12			IV
	11* 1	+ 6 3	II	III	III	2	67* 6	+ 15 1	III*	11			II*)cm
	10* 6	- 12 9	I*2	III*	III*	2	95*-6	+ 15 5	III*	15			IV*)3
	11* 3	+ 6 9	II	III*	III*	cm	98*-3	- 9 10	III	110			II*)3
	29* 1	- 6 6	II	I*0	I*0		28* 6	- 15 2	III*	12			IV
	30* 2	+ 12 6	I*2	I*0	I*0	4	67* 3	+ 9 1	III	11			IV
	73* 2	+ 15 6	I*5	I*0	I*0	cm	95*-3	+ 9 5	III	15			
	73*-2	+ 15 6	I*5	I*0	I*0		98*-6	- 15 10	III*	110			
	46*-2	+ 12 6	I*2	I*2	I*2		57*-3	- 9 4	III	14			
	61* 1	+ 6 7	II	I*1	I*1	4	91*-6	+ 15 2	III*	12			
	69*-2	- 15 10	I*5	I*4	I*4		57*-6	- 15 4	III*	14			
	85*-2	+ 15 7	I*5	I*1	I*1		91*-3	+ 9 2	III	12			
	46* 2	+ 12 6	I*2	I*2	I*2		57* 3	- 9 4	III	14			
	61*-1	+ 6 7	II	I*1	I*1	4	91* 6	+ 15 2	III*	12			
	69* 2	- 15 10	I*5	I*4	I*4		57* 6	- 15 4	III*	14			
	85* 2	+ 15 7	I*5	I*1	I*1		91* 3	+ 9 2	III	12			
	50*-1	- 10 7	I*0	I*1	I*1		14*-1	- 9 3	I*0	II			
	60*-2	+ 14 8	I*4	I*2	I*2		14*-3	- 9 9	I*0	IV*			
	94* 2	+ 16 10	I*6	I*4	I*4	8	14* 1	- 9 3	I*0	II			
	87*-2	+ 16 7	I*6	I*1	I*1		14* 3	- 9 9	I*0	IV*			
	97* 2	- 17 14	I*7	I*3	I*3		20*-2	- 12 5	III*	IV			
	92* 2	+ 17 8	I*7	I*2	I*2		20*-6	- 12 11	III*	II*			
	50* 1	- 10 7	I*0	I*1	I*1		20* 2	- 12 5	III*	IV			
	60* 2	+ 14 8	I*4	I*2	I*2		20* 6	- 12 11	III*	II*			
	94*-2	+ 16 10	I*6	I*4	I*4	8	23*-2	- 12 3	III*	II			
	87* 2	+ 16 7	I*6	I*1	I*1		23*-6	- 12 9	III*	IV*			
	97*-2	- 17 14	I*7	I*3	I*3		23* 2	- 12 3	III*	II			
	92*-2	+ 17 8	I*7	I*2	I*2		23* 6	- 12 9	III*	IV*			
648	16*-1	- 10 4	III*	II	II								
	16* 3	- 10 10	III*	IV*	IV*								
	37*-6	+ 4 10	III	IV*	IV*								
	37* 2	+ 4 4	III	II	II								

[illegible]

3888	3 ^a -2	- 12 5	II*	II } ³ _{cm}	13 ^a -1	5184	II	II	63 ^a 2	- 19 6	I*9	IV } ² ₁
	3 ^a 6	- 12 11	II*	IV* } ³ _{cm}	13 ^a -3		II	IV*	70 ^a 6	- 21 10	I*11	IV* } ² ₁
	5 ^a -1	- 8 5	I*0	II } ³	13 ^a 1		II	II	76 ^a -6	- 39 10	I*29	IV* } ² ₁
	5 ^a 3	- 8 11	I*0	IV* } ³ _{cm}	13 ^a 3		II	IV*	83 ^a -2	- 25 6	I*15	IV* } ² ₁
	6 ^a -6	- 12 13	II*	II* } ³	15 ^a -2		I*5	II	63 ^a 6	- 19 12	I*9	II* } ² ₁
	6 ^a 2	- 12 7	II*	IV } ³ _{cm}	15 ^a -6		I*5	IV*	70 ^a 2	- 21 4	I*11	II } ² ₁
	7 ^a -2	- 4 5	II	II } ³	15 ^a 2		I*5	II	76 ^a -2	- 39 4	I*29	II } ² ₁
	7 ^a 6	- 4 11	II	IV* } ³ _{cm}	15 ^a 6		I*5	IV*	83 ^a -6	- 25 12	I*15	II* } ² ₁
	8 ^a -3	- 8 13	I*0	II* } ³	16 ^a -2		I*6	II	68 ^a -2	- 24 4	I*14	II } ³
	8 ^a 1	- 8 7	I*0	IV } ³ _{cm}	16 ^a -6		I*6	IV*	82 ^a 6	- 20 12	I*10	II* } ³
	9 ^a -6	- 4 13	II	II* } ³	16 ^a 2		I*6	II	69 ^a -6	- 24 10	I*14	IV* } ³
	9 ^a 2	- 4 7	II	IV } ³ _{cm}	16 ^a 6		I*6	IV*	82 ^a 2	- 20 6	I*10	IV } ³
	31 ^a -1	- 8 5	I*0	II	35 ^a -2		I*4	IV } ³	68 ^a 2	- 24 4	I*14	II } ³
	31 ^a 3	- 8 11	I*0	IV*	62 ^a -6		I*4	IV*	82 ^a -6	- 20 12	I*10	II* } ³
	52 ^a -1	+ 11 5	I*3	II	35 ^a -6		I*4	II* } ³	68 ^a 6	- 24 10	I*14	IV* } ³
	52 ^a 3	+ 11 11	I*3	IV*	62 ^a -2		I*4	II	82 ^a -2	- 20 6	I*10	IV } ³
	53 ^a -1	- 10 7	I*2	IV	35 ^a 2		I*4	IV } ³	68 ^a 2	- 24 4	I*14	II } ³
	53 ^a 3	- 10 13	I*2	II*	62 ^a 6		I*4	IV*	82 ^a -6	- 20 12	I*10	II* } ³
	59 ^a -3	- 8 11	I*0	IV*	35 ^a 6		I*4	II* } ³	68 ^a 6	- 24 10	I*14	IV* } ³
	59 ^a 1	- 8 5	I*0	II	62 ^a 2		I*4	II	82 ^a -2	- 20 6	I*10	IV } ³
	64 ^a -3	- 18 11	I*10	IV* } ³	37 ^a -1		I*0	II				
	79 ^a -1	- 14 5	I*6	II	37 ^a -3		I*0	IV*				
	64 ^a 1	- 18 5	I*10	II } ³	37 ^a 1		I*0	II				
	79 ^a 3	- 14 11	I*6	IV* } ³	37 ^a 3		I*0	IV*				
	72 ^a -1	+ 15 5	I*7	II } ³	58 ^a -1		I*0	IV } ³				
	78 ^a 3	+ 13 11	I*5	IV* } ³	71 ^a 3		I*0	IV*				
	72 ^a 3	+ 15 11	I*7	IV* } ³	59 ^a -3		I*0	II* } ³				
	78 ^a -1	+ 13 5	I*5	II	71 ^a 1		I*0	II				
	89 ^a -6	- 4 13	II	II*	59 ^a 1		I*0	IV } ³				
	88 ^a 2	- 4 7	II	IV	71 ^a -3		I*0	IV*				
	89 ^a -3	+ 21 13	I*13	II* } ³	58 ^a 3		I*0	II* } ³				
	90 ^a 1	+ 15 7	I*7	IV	71 ^a -1		I*0	II				
	89 ^a 1	+ 21 7	I*13	IV } ³	63 ^a -2		I*9	IV } ² ₁				
	90 ^a -3	+ 15 13	I*7	II*	70 ^a -6		I*11	IV* } ² ₁				
					76 ^a 6		I*29	IV* } ² ₁				
					83 ^a 2		I*15	IV				
					63 ^a -6		I*9	II* } ² ₁				
					70 ^a -2		I*11	II } ² ₁				
					76 ^a 2		I*29	II				
					83 ^a 6		I*15	II*				

6912	25*-1	- 9 3	III	II	10368	21*-1	- 8 4	III	II
	25*-2	- 15 3	III*	II		21*-2	- 14 4	III*	II
	25*-3	- 9 9	III	IV*		21*-3	- 8 10	III	IV*
	25*-6	- 15 9	III*	IV*		21*-6	- 14 10	III*	IV*
	25* 1	- 9 3	III	II		21* 1	- 8 4	III	II
	25* 2	- 15 3	III*	II		21* 2	- 14 4	III*	II
	25* 3	- 9 9	III	IV*		21* 3	- 8 10	III	IV*
	25* 6	- 15 9	III*	IV*		21* 6	- 14 10	III*	IV*
	26*-1	- 9 5	III	IV		36*-1	- 7 6	II	IV
	26*-2	- 15 5	III*	IV		36*-2	- 13 6	I*2	IV
	26*-3	- 9 11	III	II*		36*-3	- 7 12	II	II*
	26*-6	- 15 11	III*	II*		36*-6	- 13 12	I*2	II*
	26* 1	- 9 5	III	IV		36* 1	- 7 6	II	IV
	26* 2	- 15 5	III*	IV		36* 2	- 13 6	I*2	IV
	26* 3	- 9 11	III	II*		36* 3	- 7 12	II	II*
	26* 6	- 15 11	III*	II*		36* 6	- 13 12	I*2	II*
	74*-1	- 9 3	III	II		45*-1	- 8 6	III	IV
	74*-2	- 15 3	III*	II		45*-2	- 14 6	III*	IV
	74*-3	- 9 9	III	IV*		45*-3	- 8 12	III	II*
	74*-6	- 15 9	III*	IV*		45*-6	- 14 12	III*	II*
	74* 1	- 9 3	III	II		45* 1	- 8 6	III	IV
	74* 2	- 15 3	III*	II		45* 2	- 14 6	III*	IV
	74* 3	- 9 9	III	IV*		45* 3	- 8 12	III	II*
	74* 6	- 15 9	III*	IV*		45* 6	- 14 12	III*	II*
7776	34*-1	- 6 5	III	II		81*-1	- 8 6	III	IV
	34*-3	- 6 11	III	IV*		81*-2	- 14 6	III*	IV
	34* 1	- 6 5	III	II		81*-3	- 8 12	III	II*
	34* 3	- 6 11	III	IV*		81*-6	- 14 12	III*	II*
	44*-2	- 12 5	III*	II		81* 1	- 8 6	III	IV
	44*-6	- 12 11	III*	IV*		81* 2	- 14 6	III*	IV
	44* 2	- 12 5	III*	II		81* 3	- 8 12	III	II*
	44* 6	- 12 11	III*	IV*		81* 6	- 14 12	III*	II*
	51*-1	+ 9 7	I*0	IV					
	51*-3	+ 9 13	I*0	II*					
	51* 1	+ 9 7	I*0	IV					
	51* 3	+ 9 13	I*0	II*					
	86*-1	+ 9 7	I*0	IV					
	86*-3	+ 19 2	I*0	II*					
	86* 1	+ 9 7	I*0	IV					
	86* 3	+ 19 2	I*0	II*					

15552	3*-1	-	6	5	II	II	3	cm	52* 2	+ 17	5	I*7	II
	3* 3	-	6	11	II	IV*	3	cm	52* 6	+ 17	11	I*7	IV*
	3*-3	-	6	11	II	IV*	3	cm	53*-2	- 16	7	I*6	IV
	3* 1	-	6	5	II	II	3	cm	53*-6	- 16	13	I*6	II*
	5*-2	-	14	5	II*	II	3	cm	53* 2	- 16	7	I*6	IV
	5* 6	-	14	11	II*	IV*	3	cm	53* 6	- 16	13	I*6	II*
	5*-6	-	14	11	II*	IV*	3	cm	59*-2	- 14	5	II*	II
	5* 2	-	14	5	II*	II	3	cm	59*-6	- 14	11	II*	IV*
	6*-1	-	6	7	II	IV	3	cm	59* 2	- 14	5	II*	II
	6* 3	-	6	13	II	II*	3	cm	59* 6	- 14	11	II*	IV*
	6*-3	-	6	13	II	II*	3	cm	64*-2	- 24	5	I*14	II
	6* 1	-	6	7	II	IV	3	cm	64*-6	- 20	11	I*10	IV*
	7*-1	-	10	5	I*0	II	3	cm	64*-6	- 24	11	I*14	IV*
	7* 3	-	10	11	I*0	IV*	3	cm	64*-6	- 24	11	I*14	IV*
	7*-3	-	10	11	I*0	IV*	3	cm	79*-2	- 20	5	I*10	II
	7* 1	-	10	5	I*0	II	3	cm	64* 2	- 24	5	I*14	II
	8*-2	-	14	7	II*	IV	3	cm	79* 6	- 20	11	I*10	IV*
	8* 6	-	14	13	II*	II*	3	cm	64* 6	- 24	11	I*14	IV*
	8*-6	-	14	13	II*	II*	3	cm	79* 2	- 20	5	I*10	II
	8* 2	-	14	7	II*	IV	3	cm	72*-2	+ 21	5	I*11	II
	9*-1	-	10	7	I*0	IV	3	cm	78* 6	+ 19	11	I*9	IV*
	9* 3	-	10	13	I*0	IV	3	cm	72*-6	+ 21	11	I*11	IV*
	9*-3	-	10	13	I*0	II*	3	cm	78* 2	+ 19	5	I*9	II
	9* 1	-	10	7	I*0	II*	3	cm	72* 2	+ 21	5	I*11	II
	31*-2	-	14	5	I*4	II	3	cm	78*-6	+ 19	11	I*11	IV*
	31*-6	-	14	11	I*4	IV*	3	cm	72* 6	+ 21	11	I*11	IV*
	31* 2	-	14	5	I*4	II	3	cm	78*-2	+ 19	5	I*9	II
	31* 6	-	14	11	I*4	IV*	3	cm	86*-2	+ 15	7	I*5	IV
	3*-2	-	12	5	I*2	II	3	cm	86*-6	+ 15	7	I*5	II*
	34*-6	-	12	11	I*2	IV*	3	cm	86* 2	+ 15	7	I*5	IV
	34* 2	-	12	5	I*2	II	3	cm	86* 6	+ 25	2	I*5	II*
	34* 6	-	12	11	I*2	IV*	3	cm	88*-1	- 10	7	I*0	IV
	44*-1	-	6	5	II	II	3	cm	88*-3	- 10	13	I*0	II*
	44*-3	-	6	11	II	IV*	3	cm	88* 1	- 10	7	I*0	IV
	44* 1	-	6	5	II	II	3	cm	88* 3	- 10	13	I*0	II*
	44* 3	-	6	11	II	IV*	3	cm	90*-2	+ 27	7	I*17	IV
	51*-2	+ 15	7	7	I*5	IV	3	cm	90* 6	+ 21	13	I*11	IV
	51*-6	+ 15	13	13	I*5	II*	3	cm	89*-6	+ 27	13	I*17	IV
	51* 2	+ 15	7	7	I*5	II*	3	cm	90* 2	+ 21	7	I*11	IV
	51* 6	+ 15	13	13	I*5	II*	3	cm	89* 2	+ 27	7	I*17	IV
	52*-2	+ 17	5	5	I*7	II	3	cm	90*-6	+ 21	13	I*11	IV
	52* 6	+ 17	11	11	I*7	II	3	cm	89* 6	+ 27	13	I*17	IV
	52*-6	+ 21	7	7	I*7	IV	3	cm	90*-2	+ 21	7	I*11	IV

24*-1	- 9 4	III	II)13	43*-1	62206	III	II
75* 1	- 9 4	III	II	43*-2	+ 9 5	III*	II
24*-2	- 15 4	III*	II)13	43*-3	+ 9 11	III	IV*
75* 2	- 15 4	III*	II	43*-6	+ 15 11	III*	IV*
24*-3	- 9 10	III	IV*)13	43* 1	+ 9 5	III	II
75* 3	- 9 10	III	IV*	43* 2	+ 15 5	III*	II
24*-6	- 15 10	III*	IV*)13	43* 3	+ 9 11	III	IV*
75* 6	- 15 10	III*	IV*	43* 6	+ 15 11	III*	IV*
24* 1	- 9 4	III	II)13	66*-1	+ 9 7	III	IV
75*-1	- 9 4	III	II	66*-2	+ 15 7	III*	IV
24* 2	- 15 4	III*	II)13	66*-3	+ 9 13	III	II*
75*-2	- 15 4	III*	II	66*-6	+ 15 13	III*	II*
24* 3	- 9 10	III	IV*)13	66* 1	+ 9 7	III	IV
75*-3	- 9 10	III	IV*	66* 2	+ 15 7	III*	IV
24* 6	- 15 10	III*	IV*)13	66* 3	+ 9 13	III	II*
75*-6	- 15 10	III*	IV*	66* 6	+ 15 13	III*	II*
56*-1	- 9 4	III	II	84*-1	+ 9 7	III	IV
56*-2	- 15 4	III*	II	84*-2	+ 15 7	III*	IV
56*-3	- 9 10	III	IV*	84*-3	+ 9 13	III	II*
56*-6	- 15 10	III*	IV*	84*-6	+ 15 13	III*	II*
56* 1	- 9 4	III	II	84* 1	+ 9 7	III	IV
56* 2	- 15 4	III*	II	84* 2	+ 15 7	III*	IV
56* 3	- 9 10	III	IV*	84* 3	+ 9 13	III	II*
56* 6	- 15 10	III*	IV*	84* 6	+ 15 13	III*	II*
31104							
32*-1	+ 7 5	II	II				
32*-2	+ 13 5	I*2	II				
32*-3	+ 7 11	II	IV*				
32*-6	+ 13 11	I*2	IV*				
32* 1	+ 7 5	II	II				
32* 2	+ 13 5	I*2	II				
32* 3	+ 7 11	II	IV*				
32* 6	+ 13 11	I*2	IV*				

TABLE 5

This is a table of the dimensions of the rational eigenspaces of the Hecke algebra T , acting on the differential forms on $H/\Gamma_0(N)$, for $N \leq 300$.

The first two columns of the table contain the level N , and its prime factors $p_1, \dots, p_r$.

The third column lists the splitting of the space of all differential forms, old and new, given by the involutions $W_i = W(p_i)$ ($i = 1, \dots, r$). The dimensions of the eigenspaces corresponding to the r -tuple of eigenvalues $(\epsilon_1, \dots, \epsilon_r)$ of $W_1, \dots, W_r$ are listed in the order

$$\epsilon_1 = +1, \quad \epsilon_1 = -1 \quad \text{if } r = 1;$$

$$(\epsilon_1, \epsilon_2) = (+1, +1), (+1, -1), (-1, +1), (-1, -1) \quad \text{if } r = 2;$$

$$(\epsilon_1, \epsilon_2, \epsilon_3) = +++, ++-, +-+, +--, -++-, -+-, --+, ---, \text{ if } r = 3;$$

in case $r = 4$ ($N = 210$) the first row is $\epsilon_4 = +1$, the second is $\epsilon_4 = -1$.

The first column contains the dimensions of the rational eigenspaces of the Hecke algebra acting on the subspace consisting of the newforms only. The W -eigenspaces are in the same order as in column 3, and are separated by commas; for each W -eigenspace we list the partition which describes its splitting into rational eigenspaces of T .

N	Factors	W-split of allforms	Complete split of newforms
11	11	0,1	0,1
14	2,7	0,1,0,0	0,1,0,0
15	3,5	0,1,0,0	0,1,0,0
17	17	0,1	0,1
19	19	0,1	0,1
20	2,5	0,0,1,0	0,0,1,0
21	3,7	0,0,1,0	0,0,1,0
22	2,11	0,1,0,1	0,0,0,0
23	23	0,2	0,2
24	2,3	0,0,1,0	0,0,1,0
26	2,13	0,1,1,0	0,1,1,0
27	3	0,1	0,1
28	2,7	0,1,0,1	0,0,0,0
29	29	0,2	0,2
30	2,3,5	0,1,1,0,0,1,0,0	0,0,1,0,0,0,0,0
31	31	0,2	0,2
32	2	0,1	0,1
33	3,11	0,2,0,1	0,1,0,0
34	2,17	0,1,1,1	0,0,1,0
35	5,7	0,1,2,0	0,1,2,0
36	2,3	0,0,1,0	0,0,1,0
37	37	1,1	1,1
38	2,19	0,2,1,1	0,1,1,0
39	3,13	0,1,2,0	0,1,2,0
40	2,5	1,1,1,0	0,1,0,0
41	41	0,3	0,3
42	2,3,7	0,1,1,1,1,0,1,0	0,0,0,0,1,0,0,0
43	43	1,2	1,2
44	2,11	0,2,1,1	0,0,1,0
45	3,5	0,1,1,1	0,0,1,0
46	2,23	0,3,0,2	0,1,0,0
47	47	0,4	0,4
48	2,3	1,1,1,0	0,1,0,0
49	7	0,1	0,1
50	2,5	0,1,1,0	0,1,1,0
51	3,17	0,3,1,1	0,2,1,0
52	2,13	1,1,2,1	0,0,1,0
53	53	1,3	1,3
54	2,3	0,2,1,1	0,1,1,0
55	5,11	0,3,1,1	0,2,1,0
56	2,7	0,3,1,1	0,1,1,0
57	3,19	1,1,2,1	1,0,1+1,0
58	2,29	1,2,1,2	1,0,1,0
59	59	0,5	0,5
60	2,3,5	0,2,1,0,1,1,2,0	0,0,0,0,0,0,0,0

N	Factors	W-split of allforms	Complete split of newforms
61	61	1,3	1,3
62	2,31	0,4,1,2	0,2,1,0
63	3,7	1,2,2,0	0,2,1,0
64	2	1,2	0,1
65	5,13	1,2,2,0	1,2,2,0
66	2,3,11	0,2,1,1,1,2,0,2	0,0,1,0,1,0,0,1
67	67	2,3	2,1+2
68	2,17	1,2,3,1	0,0,2,0
69	3,23	0,4,1,2	0,2,1,0
70	2,5,7	0,2,2,1,1,1,2,0	0,0,0,0,1,0,0,0
71	71	0,6	0,3+3
72	2,3	1,1,2,1	0,1,0,0
73	73	2,3	2,1+2
74	2,37	1,3,3,1	0,2,2,0
75	5,7	1,2,2,0	0,1,1+1,0
76	2,19	1,3,2,2	0,0,1,0
77	7,11	1,2,3,1	1,1,1+2,0
78	2,3,13	0,3,2,1,1,1,3,0	0,1,0,0,0,0,0,0
79	79	1,5	1,5
80	2,5	1,2,3,1	0,1,1,0
81	3	1,3	0,2
82	2,41	1,3,2,3	1,0,2,0
83	83	1,6	1,6
84	2,3,7	1,1,2,1,2,1,1,2	0,0,0,0,1,0,0,1
85	5,17	2,2,2,1	2,1,2,0
86	2,43	1,4,3,2	0,2,2,0
87	3,29	0,5,2,2	0,3,2,0
88	2,11	2,2,3,2	1,0,2,0
89	89	1,6	1,1+5
90	2,3,5	1,2,2,1,1,1,1,2	0,1,0,0,1,0,0,1
91	7,13	1,3,2,1	1,3,2,1
92	2,23	0,5,1,4	0,0,1,1
93	3,31	2,2,3,2	2,0,3,0
94	2,47	0,6,1,4	0,2,1,0
95	5,19	0,5,3,1	0,4,3,0
96	2,3	1,2,4,2	0,1,1,0
97	97	3,4	3,4
98	2,7	1,3,2,1	0,1,2,0
99	3,11	1,4,2,2	1,1,1+1,0
100	2,5	1,1,3,2	0,0,1,0
101	101	1,7	1,7
102	2,3,17	1,3,2,1,1,3,2,2	1,0,1,0,0,0,0,1
103	103	2,6	2,6
104	2,13	2,4,4,1	0,2,1,0
105	3,5,7	0,3,3,1,1,1,3,1	0,2,0,0,0,0,0,1
106	2,53	2,4,3,3	1,1,1+1,0
107	107	2,7	2,7
108	2,3	1,3,3,3	0,0,1,0
109	109	3,5	3,1+4
110	2,5,11	0,4,3,1,1,3,1,2	0,1,2,0,1,0,0,1

N	Factors	W-split of allforms	Complete split of newforms
111	3,37	1,4,5,1	0,3,4,0
112	2,7	2,4,2,3	1,1,1,0
113	113	3,6	3,1+2+3
114	2,3,19	1,3,2,2,3,1,3,2	0,1,0,0,1,0,0,1
115	5,23	2,3,4,2	2,1,4,0
116	2,29	2,4,5,2	0,0,1+1+1,0
117	3,13	2,3,4,2	0,2,2,1
118	2,59	1,6,2,5	1,1,1+1,0
119	7,17	0,6,4,1	0,5,4,0
120	2,3,5	1,3,4,1,2,3,2,1	0,0,1,0,0,0,0,1
121	11	2,4	1,1+1+1
122	2,61	2,5,4,3	1,2,3,0
123	3,41	1,6,2,4	1,3,2,1
124	2,31	1,6,2,5	0,0,1,1
125	5	2,6	2,2+4
126	2,3,7	1,4,3,1,2,2,3,1	0,0,1,0,0,0,0,1
127	127	3,7	3,7
128	2	3,6	1,1+1+1
129	3,43	2,4,5,2	1,2,1+3,0
130	2,5,13	1,3,2,2,3,2,3,1	0,0,0,1,1,0,0,1
131	131	1,10	1,10
132	2,3,11	1,4,1,3,3,2,2,3	0,0,0,0,1,0,0,1
133	7,19	2,4,2,3	2,3,2,2
134	2,67	2,6,5,3	0,3,3,0
135	3,5	2,5,4,2	1,1+2,2,0
136	2,17	3,4,5,3	0,2,1,1
137	137	4,7	4,7
138	2,3,23	1,5,2,3,1,4,1,4	1,0,1,0,1,0,0,2
139	139	3,8	3,1+7
140	2,5,7	1,3,4,1,3,3,2,2	0,0,0,0,1,0,0,1
141	3,47	1,7,2,5	1,1+2,1+1,1
142	2,71	1,8,1,7	1,1+1,1,1
143	11,13	1,6,5,1	1,6,4,0
144	2,3	3,4,4,2	0,1,1,0
145	5,29	1,5,3,4	1,3,3,2
146	2,73	2,6,6,3	0,3,4,0
147	3,7	2,3,4,2	2,1+1,1+2,0
148	2,37	4,4,5,4	0,0,2,1
149	149	3,9	3,9
150	2,3,5	1,4,3,2,3,2,3,1	0,1,0,0,1,0,0,1
151	151	3,9	3,3+6
152	2,19	3,5,6,3	1,1,3,0
153	3,17	2,5,4,4	1,1,1+2,1
154	2,7,11	2,3,4,2,2,2,3,3	1,1,0,0,1,0,0,2
155	5,31	1,7,4,3	1,1+4,4,1
156	2,3,13	1,4,5,1,2,4,4,2	0,0,0,0,0,1,0,1
157	157	5,7	5,7
158	2,79	2,8,3,6	1,1+2,1+1,1
159	3,53	1,8,5,3	0,5,4,0
160	2,5	4,5,5,3	1,2,1,0

N	Factors	W-split of allforms	Complete split of newforms
161	7,23	2,5,6,2	2,3,1+5,0
162	2,3	3,5,4,4	1,1,1+1,0
163	163	6,7	1+5,7
164	2,41	3,6,7,3	0,0,4,0
165	3,5,11	2,4,2,3,2,3,1,4	2,0,0,0,2,0,0,3
166	2,83	2,8,4,6	1,2,3,0
167	167	2,12	2,12
168	2,3,7	2,4,3,4,5,2,3,2	0,1,1,0,0,0,0,0
169	13	3,5	3,2+3
170	2,5,17	2,4,3,2,4,2,3,3	0,1+1,1,1,1,0,0,2
171	3,19	3,6,6,2	0,4,1+1+1,1
172	2,43	4,6,5,5	0,0,2,1
173	173	4,10	4,10
174	2,3,29	1,6,5,2,2,5,3,3	0,1,1+1,0,1,0,0,1
175	5,7	3,5,5,2	1,2+2,1+2,1
176	2,11	4,6,6,3	0,1+2,1,1
177	3,59	2,8,2,7	2,3,2,2
178	2,89	3,7,5,6	2,1,1+3,0
179	179	3,12	3,1+11
180	2,3,5	2,3,3,3,5,3,3,3	0,0,0,0,0,0,0,1
181	181	5,9	5,9
182	2,7,13	1,5,4,3,4,3,3,2	0,1,1,0,1+1,0,0,1
183	3,61	3,6,7,3	2,3,6,0
184	2,23	2,9,3,7	1,1+1,2,1
185	5,37	3,6,6,2	1+1,5,5,1
186	2,3,31	2,5,4,4,5,2,4,3	0,1,1,0,2,0,0,1
187	11,17	3,6,4,4	3,1+4,1+2,2
188	2,47	1,10,3,8	0,0,2,2
189	3,7	3,5,7,4	1,1+2,1+2,1
190	2,5,19	1,6,5,2,1,6,4,2	1,0,2,0,0,1,0,1
191	191	2,14	2,14
192	2,3	5,6,6,4	1,1+1,1,0
193	193	7,8	2+5,8
194	2,97	3,8,8,4	0,4,1+4,0
195	3,5,13	1,6,4,2,4,2,4,2	0,3,1,0,1,0,0,1+1
196	2,7	3,4,6,4	0,0,1+2,1
197	197	6,10	1+5,10
198	2,3,11	2,5,4,3,3,5,3,4	0,1,1,1,1,0,0,1
199	199	4,12	4,2+10
200	2,5	4,6,6,3	0,1+1,1+1,1
201	3,67	4,6,7,4	1+1,3,5,1
202	2,101	4,8,5,7	3,1,4,0
203	7,29	3,6,7,3	3,2+2,1+5+1,1
204	2,3,17	2,6,4,3,5,3,5,3	0,0,0,0,1,0,0,1
205	5,41	2,7,4,6	2,1+3,1+3,1+2
206	2,103	2,11,6,6	0,1+2+2,4,0
207	3,23	3,8,5,5	2,2,2+2,1
208	2,13	5,6,7,5	1,2,1+1,1
209	11,19	2,8,6,3	2,7,5,1
210	2,3,5,7	1,4,3,2,2,3,3,3, 2,3,4,2,2,2,4,1	1,0,0,0,0,0,0,1, 0,0,0,1,0,1,1,0

N	Factors	W-split of allforms	Complete split of newforms
211	211	6,11	3+3,2+9
212	2,53	5,7,8,5	0,0,1+3,1
213	3,71	2,10,3,8	2,4,1+2,2
214	2,107	4,9,5,8	1+1,2,1+2,1
215	5,43	2,8,9,2	1,6,5+3,0
216	2,3	5,7,8,5	1,1,1+1,0
217	7,31	3,7,4,5	3,5,4,3
218	2,109	5,8,7,6	2,3,2+2,1
219	3,73	4,7,8,4	1+1,4,6,1
220	2,5,11	1,7,4,3,3,5,5,3	0,0,0,0,0,0,1,1
221	13,17	2,7,6,4	2,1+1+2+2,6,3
222	2,3,37	1,8,6,3,4,4,7,2	0,1+1,1,0,1,0,0,1
223	223	6,12	2+4,12
224	2,7	4,9,7,5	1,1+2,2,0
225	3,5	4,5,6,4	1,1+2,1+1,1
226	2,113	5,8,7,7	2,2,4,1
227	227	5,14	2+3,2+2+10
228	2,3,19	4,4,5,4,5,4,4,5	0,0,0,0,1,1,0,2
229	229	7,11	1+6,11
230	2,5,23	2,6,6,3,5,3,4,4	0,2,2,0,3,0,0,2
231	3,7,11	1,6,6,2,5,3,3,3	0,3,1+2,0,3,0,0,2
232	2,29	7,7,7,6	1,3,1,2
233	233	7,12	7,1+11
234	2,3,13	3,6,5,4,5,3,5,4	1,0,1,0,1,0,0,1+1
235	5,47	5,6,7,5	5,1+1,7,1
236	2,59	3,11,7,7	0,0,3+1,1
237	3,79	5,7,8,5	4,2,7,0
238	2,7,17	1,8,6,2,2,6,6,2	1,2,1,0,1,0,1,1
239	239	3,17	3,17
240	2,3,5	3,7,5,4,5,4,6,3	1,1,0,0,1,0,0,1
241	241	7,12	7,12
242	2,11	4,7,6,5	2,1+2,2+2,1
243	3	7,12	1+3,1+2+2+3
244	2,61	6,8,9,6	0,0,4,1
245	5,7	3,7,6,5	2,1+2+2,2+2,1+1
246	2,3,41	3,7,5,4,4,6,4,6	1,1,1+1,0,1,0,0,1+1
247	13,19	4,6,7,4	4,5,2+5,3
248	2,31	3,12,6,8	1,3,1+2,1
249	3,83	3,11,5,8	1+1,5,4,2
250	2,5	5,9,7,7	2,2,2+2,0
251	251	4,17	4,17
252	2,3,7	3,6,6,2,4,6,6,4	0,0,0,0,0,0,1,1
253	11,23	5,5,7,6	5,3,6,3
254	2,127	4,12,7,8	1,5,1+1+2,1
255	3,5,17	2,6,5,4,7,2,3,4	0,2,2,0,4,0,0,3
256	2	9,12	1+1,1+1+2
257	257	7,14	7,14
258	2,3,43	3,7,5,5,6,4,7,4	1,1,0,1,1+1,0,0,1+1
259	7,37	4,7,8,4	3,2+4,1+2+4,3
260	2,5,13	4,5,5,3,6,4,4,6	0,0,0,0,1,0,0,3

N	Factors	W-split of allforms	Complete split of newforms
261	3,29	4,9,7,7	2,2,2+3,2
262	2,131	4,12,5,11	1+2,2,2+2,1
263	263	5,17	5,17
264	2,3,11	4,5,6,4,7,5,4,6	0,1,1+1,0,0,0,0,1
265	5,53	6,7,7,5	1+2+2,2+2,2+4,2
266	2,7,19	2,7,5,5,6,4,3,5	0,2,2,0,3,0,0,2
267	3,89	4,11,5,9	3,1+4,1+3,3
268	2,67	7,9,8,8	0,0,1+2,2
269	269	6,16	1+5,16
270	2,3,5	3,7,8,4,5,7,5,4	0,1,1,0,1,0,0,1
271	271	6,16	6,16
272	2,17	6,9,10,6	1,1+2,1+2,1
273	3,7,13	4,4,4,3,5,4,4,5	3,0,2,1,1,0,0,4
274	2,137	6,10,9,8	1+1,3,5,1
275	5,11	4,9,7,5	1+2,1+2+2,2+4,2
276	2,3,23	2,9,3,7,5,6,3,8	0,0,0,0,2,0,0,2
277	277	10,12	1+9,3+9
278	2,139	5,12,8,9	2,1+3,5,1
279	3,31	5,10,10,4	0,6,2+3,2
280	2,5,7	4,6,5,6,7,4,5,4	1,0,0,1,2,0,0,2
281	281	7,16	7,16
282	2,3,47	3,9,4,7,3,8,3,8	2,0,2,0,1,1,0,3
283	283	9,14	9,14
284	2,71	2,15,5,12	0,0,3,3
285	3,5,19	2,7,8,2,4,6,5,3	1,2,1+2,0,2,1,0,2
286	2,11,13	2,8,8,2,3,7,6,3	1,1,3,0,1,1,0,1+1
287	7,41	2,12,8,5	2,3+6,3+5,2
288	2,3	7,8,10,8	1,1+1,1,1
289	17	7,10	1+2+3,2+3+4
290	2,5,29	3,7,6,4,5,5,4,7	1,2,2,0,3,0,0,3
291	3,97	6,9,10,6	1+2,1+1+1+2,7,2
292	2,73	8,9,10,8	0,0,4,2
293	293	8,16	8,16
294	2,3,7	3,7,6,5,6,4,6,4	0,1+1,1,1,1,0,0,1+1
295	5,59	3,12,6,8	3,7,6,3
296	2,37	7,11,11,6	1,4,3,1
297	3,11	6,10,8,7	1+2,2+3,1+3,1+1
298	2,149	7,11,8,10	1+3,2,5,1
299	13,23	2,12,9,4	2,10,2+2+2+3,2
300	2,3,5	4,6,6,3,6,6,6,6	0,0,0,0,1,1,0,1+1

TABLE 6

For primes up to 307, we list the polynomial whose roots are the super-singular values of j .

P	Supersingular values	P	Supersingular values
13	(j-5)	71	(j-17)(j+31)(j+30)(j+23)(j+5)
17	(j-8)	73	(j-9)(j+17)(j ² -5j+9)(j ² -16j+8)
19	(j-7)	79	(j-15)(j-17)(j-21)(j+15)(j ² +14j-17)
23	(j+4)	83	(j-17)(j-28)(j+33)(j+16)(j ² +7j-10)
29	(j-2)(j+4)	89	(j-6)(j-7)(j-13)(j+37)(j+23)(j ² +26j-33)
31	(j-2)(j-4)	97	(j-1)(j-20)(j ² +42j+8)(j ² +32j-30)(j ² +7j+45)
37	(j-8)(j ² -6j-6)	101	(j-3)(j-21)(j+44)(j+42)(j+37)(j+35)(j ² +27j-47)
41	(j-3)(j+13)(j+9)	103	(j-23)(j-24)(j-34)(j+34)(j ² -19j-30)(j ² -40j-34)
43	(j+2)(j ² +19j+16)	107	(j-47)(j+35)(j+26)(j+13)(j ² -25j+30)(j ² -41j-49)
47	(j-9)(j-10)(j+3)	109	(j-17)(j-41)(j-43)(j ² -31j-23)(j ² -48j+17)(j ² +22j+23)
53	(j+7)(j+3)(j ² -3j-14)	113	(j-54)(j+41)(j+14)(j ² +32j-48)(j ² +18j+38)(j ² +9j-31)
59	(j-15)(j-28)(j+12)(j+11)	127	(j+54)(j+32)(j+2)(j+1)(j ² -32j-25)(j ² -39j+8)(j ² +17j+38)
61	(j-9)(j+20)(j+11)(j ² -23j+24)	131	(j-10)(j-28)(j-31)(j-50)(j-62)(j+49)(j+37)(j+18)(j ² -47j-42)
67	(j+1)(j ² -23j+24)(j ² +8j-22)	137	(j-22)(j+59)(j+1)(j ² -9j-35)(j ² -38j-24)(j ² +39j-18)(j ² +30j-46)
139	(j-8)(j-36)(j-44)(j-65)(j+39)(j ² +32j+23)(j ² +25j-45)(j ² +8j+8)		
149	(j-12)(j-30)(j-62)(j-68)(j-74)(j+46)(j ² -21j+18)(j ² -35j-44)(j ² +18j+22)		
151	(j-29)(j+50)(j+27)(j+8)(j+3)(j+1)(j ² +69j-8)(j ² +36j+65)(j ² +4j+24)		
157	(j+78)(j+23)(j+7)(j ² -44j-8)(j ² +71j+45)(j ² +47j-1)(j ² +28j+46)(j ² +7j+2)		
163	(j+36)(j ² -11j-53)(j ² -38j+27)(j ² -44j+21)(j ² +72j+61)(j ² +70j-28)(j ² +24j+78)		
167	(j-15)(j-27)(j-30)(j-59)(j+78)(j+55)(j+36)(j+35)(j+16)(j ² -9j+45)(j ² +9j-44)		
173	(j-17)(j-24)(j-42)(j-85)(j+71)(j+14)(j ² -21j-40)(j ² -55j+38)(j ² -62j+85)(j ² -65j+2)		
179	(j-22)(j-35)(j-61)(j+67)(j+59)(j+58)(j+39)(j+8)(j ² -10j+44)(j ² -35j-51)(j ² -39j-87)		
181	(j-36)(j-64)(j+35)(j+8)(j+6)(j ² -6j+86)(j ² -32j-30)(j ² -33j-31)(j ² -72j-22)(j ² +73j-27)		
191	(j-16)(j-41)(j-46)(j-55)(j-66)(j+85)(j+84)(j+53)(j+41)(j+22)(j+15)(j ² -46j+76)(j ² -61j-93)		

p Supersingular values

193	$(j-42)(j+24)(j^2-34j-50)(j^2-35j-24)(j^2-43j-1)(j^2-45j+1)(j^2-81j-94)(j^2+90j-27)(j^2+33j+71)$
197	$(j-22)(j-72)(j+77)(j+66)(j^2-29j-88)(j^2-48j+53)(j^2-84j+63)(j^2+79j-13)(j^2+75j-1)(j^2+18j+8)$
199	$(j-8)(j-40)(j-61)(j-90)(j-98)(j+59)(j+52)(j^2+99j+5)(j^2+44j-88)(j^2+20j-76)(j^2+16j+74)$
211	$(j-28)(j-82)(j+97)(j+63)(j+13)(j^2-25j+97)(j^2-27j+86)(j^2-49j-65)(j^2-59j+88)(j^2-90j-5)(j^2+56j+23)$
223	$(j-49)(j+95)(j+30)(j+28)(j+13)(j+2)(j^2-25j+7)(j^2-26j+1)(j^2-49j+49)(j^2-86j+95)(j^2+87j-30)(j^2+12j+54)$
227	$(j-30)(j-110)(j+113)(j+95)(j+80)(j+67)(j+36)(j+26)(j^2-4j-41)(j^2-59j-19)(j^2+102j-26)(j^2+81j+63)(j^2+73j-64)$
229	$(j-27)(j-60)(j-93)(j+57)(j+15)(j^2-67j+16)(j^2+63j-13)(j^2+55j-54)(j^2+51j-107)(j^2+32j+86)(j^2+20j+2)(j^2+14j+84)$
233	$(j-11)(j-85)(j+56)(j+50)(j+46)(j^2-64j-62)(j^2-71j-17)(j^2-86j+62)(j^2+81j+81)(j^2+64j+57)(j^2+55j-94)(j^2+25j+109)$
239	$(j-68)(j-105)(j-107)(j-113)(j+54)(j+47)(j+46)(j+25)(j+24)(j+22)(j+21)(j+14)(j+4)(j^2-43j+59)(j^2+96j-59)(j^2+51+86)$
241	$(j-8)(j-28)(j-64)(j-93)(j+25)(j+1)(j^2-35j-30)(j^2-75j-61)(j^2-81j+117)(j^2+111j+25)(j^2+28j+79)(j^2+27j+44)(j^2+11j-85)$
251	$(j-4)(j-24)(j-30)(j-35)(j-64)(j-101)(j+112)(j+66)(j+52)(j+44)(j+38)(j+19)(j^2-60j-81)(j^2-81j-68)(j^2-105j+116)(j^2+93j+91)$
257	$(j-30)(j-115)(j-121)(j+118)(j+59)(j+34)(j+8)(j^2-13j-87)(j^2-40j+87)(j^2-52j+20)(j^2-56j-14)(j^2-68j-102)(j^2-74j-6)(j^2-104j-32)$
263	$(j-31)(j-37)(j-55)(j-85)(j-107)(j-108)(j-110)(j+122)(j+114)(j+79)(j+55)(j^2-46j+65)(j^2-64j+80)(j^2-106j-126)(j^2-110j-35)(j^2+95j+121)$
269	$(j-5)(j-92)(j-111)(j-122)(j+127)(j+80)(j+72)(j+70)(j+69)(j+54)(j^2-37j+75)(j^2-87j+1)(j^2-117j+50)(j^2+105j-3)(j^2+32j+13)(j^2+22j+73)$
271	$(j-23)(j-47)(j-69)(j-98)(j-125)(j+130)(j+123)(j+69)(j+35)(j+31)(j^2-53j-35)(j^2-70j-119)(j^2-95j-98)(j^2-114j-41)(j^2+80j+132)$ $x(j^2+66j+90)$
277	$(j-61)(j+82)(j+33)(j^2-4j-131)(j^2-44j-76)(j^2-49j+76)(j^2-61j+32)(j^2-82j-82)(j^2-105j+122)(j^2-106j-60)(j^2+91j+8)(j^2+57j-132)$ $x(j^2+32j-38)$
281	$(j-5)(j-48)(j-84)(j-90)(j-109)(j-130)(j+32)(j+29)(j^2-38j+7)(j^2-79j-63)(j^2-81j-56)(j^2+131j+32)(j^2+49j-134)(j^2+37j-3)$ $x(j^2+17j+44)$
283	$(j-21)(j-60)(j-78)(j-122)(j+32)(j^2-84)(j^2-58j-54)(j^2-71j-115)(j^2-83j+60)(j^2-109j-141)(j^2-133j-111)(j^2+111j+108)(j^2+56j-4)$ $x(j^2+45j-42)$
293	$(j-48)(j-88)(j-89)(j-124)(j-127)(j-141)(j+81)(j+50)(j^2-50j-40)(j^2-124j-144)(j^2+128j-29)(j^2+120j+116)(j^2+104j+79)(j^2+54j+101)$ $x(j^2+19j-72)(j^2+2j-1)$
307	$(j-2)(j-38)(j-81)(j-144)(j+2)(j^2-j+102)(j^2-47j-12)(j^2-66j-113)(j^2-143j+152)(j^2-153j+64)(j^2+108j+6)(j^2+102j-57)(j^2+71j+36)$ $x(j^2+45j+140)(j^2+43j-102)$