PADOVA UNIVERSITY PRESS

Dolomites Research Notes on Approximation

Volume 7 · 2014 · Pages 1–15

The finiteness conjecture for 3 × 3 binary matrices

Thomas Mejstrik[a]

Communicated by ....

Abstract

The invariant polytope algorithm was a breakthrough in the joint spectral radius computation, allowing to find the exact value of the joint spectral radius for most matrix families [7, 8]. This algorithm found many applications in problems of functional analysis, approximation theory, combinatorics, etc..
In this paper we propose a modification of the invariant polytope algorithm enlarging the class of problems to which it is applicable. Precisely, we introduce mixed numeric and symbolic computations. A further minor modification of augmenting the input set with additional matrices speeds up the algorithm in certain cases.
With this modifications we are able to automatically prove the finiteness conjecture for all pairs of binary 3×3 matrices and sign 2×2 matrices.

1 Introduction

In this paper we are concerned with the maximal asymptotic growth rate of products of matrices, the so called *joint spectral radius*. It has been defined in 1960 [18] and since found applications in many seemingly unconnected areas of mathematics and engineering, e.g. for computing the regularity of wavelets and of subdivision schemes [4], the capacity of codes [16], the stability of linear switched systems [6].

Definition 1.1. Given a finite set of matrices $\mathcal{A} \subseteq \mathbb{R}^{s\times s}$. The *joint spectral radius* (JSR) of $\mathcal{A}$ is defined as

$$\mathrm{JSR}(\mathcal{A}) := \lim_{n\to\infty} \max_{A_j\in\mathcal{A}} \|A_{j_n} \cdots A_{j_1}\|^{1/n}, \tag{1}$$

where $\|\cdot\|$ is any sub-multiplicative matrix norm.

An open question in the joint spectral radius theory is the so called *finiteness conjecture* [13]:

Given a matrix set, does there exist a finite product whose
powers' spectral radii attain the growth rate equal to its joint spectral radius?

The finiteness conjecture has been proven false, in the sense that such a finite product does not always exist; although this case seems to be exceptional [1, 2, 12, 11, 9]. In this paper we proof the finiteness conjecture for pairs of binary matrices of dimension 3.

1.1 Overview and main results

In Section 2 we present the *invariant polytope algorithm (ipa)* for computing the JSR of a finite set of square matrices. In Section 2.1 we discuss how mixed numeric-symbolic computations can be used to widen the classes of matrices where the ipa is applicable. In Section 2.2 we show how we can augment our input set of matrices to obtain faster termination properties.

Finally, in Section 3 we discuss how the ipa, together with the discussed modifications, can automatically proof the finiteness conjecture for pairs of binary matrices of dimension 2 and 3, as well for pairs of sign matrices of dimension 2.

1.2 Notation

The set of all integers is denoted by $\mathbb{N}$, integers including zero by $\mathbb{N}_0$, reals by $\mathbb{R}$, non-negative reals by $\mathbb{R}_+$, complex numbers by $\mathbb{C}$. Given $X \subseteq \mathbb{C}^s$, where $s \in \mathbb{N}$ is the dimension, we denote the closure of X by $\mathrm{cl}(X)$ and its interior by X°. Products of sets are understood element wise, e.g. $A \cdot B = \{a \cdot b : a \in A,\ b \in B\}$. Comparisons of matrices are understood element wise. For a matrix A we denote by A^T its transpose and for a square matrix by $\rho(A)$ its spectral radius.

We will make use of various convex hulls of sets throughout the paper.

Definition 1.2. • For $V \subseteq \mathbb{R}^s$, we define its *convex hull* $\mathrm{co}\, V$ as the intersection of all convex sets containing V.

[a]University of Vienna, Austria, e-mail: thomas.mejstrik@gmx.at; The author is sponsored by the Austrian Science Foundation (FWF) grant P 33352.

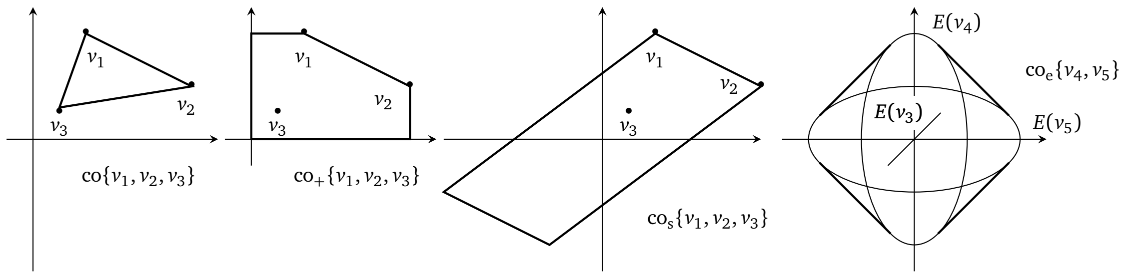

Figure 1: Various convex hulls. $v_1 = \left[\begin{smallmatrix}1\\2\end{smallmatrix}\right]$, $v_2 = \left[\begin{smallmatrix}2\\1\end{smallmatrix}\right]$, $v_3 = \left[\begin{smallmatrix}0.5\\0.5\end{smallmatrix}\right]$, $v_4 = \left[\begin{smallmatrix}2\\i\end{smallmatrix}\right]$, $v_5 = \left[\begin{smallmatrix}i\\2\end{smallmatrix}\right]$.

- For $V \subseteq \mathbb{R}^s_+$, we define the *cone hull* of V (in the first orthant) by
$$\mathrm{co}_+ V = \left\{x \in \mathbb{R}^s_+ : x = y - z,\ y \in \mathrm{co}(V),\ z \in \mathbb{R}^s_+\right\} \subseteq \mathbb{R}^s_+. \tag{2}$$
- For $V \subseteq \mathbb{R}^s$, we define the *symmetric convex hull* of V by
$$\mathrm{co}_\mathrm{s} V = \mathrm{co}\{V, -V\} \subseteq \mathbb{R}^s. \tag{3}$$
- For $v = a + ib \in \mathbb{C}^s$ we define its corresponding ellipse $E(v) = E(a, b) \subseteq \mathbb{R}^s$ as the two dimensional subset $\{a \cos t + b \sin t : t \in \mathbb{R}\} \subseteq \mathbb{R}^s$. For $V \subseteq \mathbb{C}^s$, we define the *elliptic convex hull* of V by
$$\mathrm{co}_\mathrm{e} V = \mathrm{co}\{E(v) : v \in V\} \subseteq \mathbb{R}^s. \tag{4}$$
- For simplicity, we denote with $\mathrm{co}_* V$ any of the convex hulls co_+, co_s, co_e, depending on the context.

We will use the aforementioned convex hulls to define norms via their unit ball.

Definition 1.3. Let $P \in \mathbb{R}^s$ be a compact, convex set with non-empty interior, and such that $rP \subseteq P$ for all $|r| \leq 1$. We define the *Minkowski norm* $\|\cdot\|_P : \mathbb{R}^s \to \mathbb{R}$ by
$$\|x\|_P = \min\{r > 0 : x \in rP\}. \tag{5}$$

2 The invariant polytope algorithm

The *invariant polytope algorithm (ipa)* for the computation of the JSR makes use of the inequality [4],
$$\max_{A_j \in \mathcal{A}} \rho\left(A_{j_k} \cdots A_{j_1}\right)^{1/k} \leq \mathrm{JSR}(\mathcal{A}) \leq \max_{A_j \in \mathcal{A}} \left\|A_{j_k} \cdots A_{j_1}\right\|^{1/k}, \tag{6}$$
which holds for any $k \in \mathbb{N}$ and any sub-multiplicative norm $\|\cdot\|$. Before we can describe how the ipa works, we need a few further definitions.

Definition 2.1. • For a product $A_{j_k} \cdots A_{j_1}$ we say the number $\rho\left(A_{j_k} \cdots A_{j_1}\right)^{1/k}$ is its *averaged spectral radius*.

If there exists a product $\Pi = A_{j_n} \cdots A_{j_1}$, $A_j \in \mathcal{A}$, such that $\rho(\Pi)^{1/n} = \mathrm{JSR}(\mathcal{A})$, i.e. its averaged spectral radius equals the joint spectral radius, we call the product a *spectral maximizing product (s.m.p.)*.

• Given a matrix $\Pi \in \mathbb{R}^{s \times s}$, we call the eigenvalues largest in modulus the *leading eigenvalues* and the corresponding eigenvectors the *leading eigenvectors*. If there exists only one largest eigenvalue in modulus (counted with algebraic multiplicity), we say the leading eigenvalue is *simple*.

• Given a bounded set of matrices $\mathcal{A} \subseteq \mathbb{R}^{s \times s}$ with $\lambda = \mathrm{JSR}(\mathcal{A}) > 0$ and let $\tilde{\mathcal{A}}$ be the set of normalized matrices $\tilde{\mathcal{A}} = \{A_j/\lambda : A_j \in \mathcal{A}\}$. $\mathcal{A}$ is said to posses a spectral gap (at $\mathrm{JSR}(\mathcal{A})$) if there exists $\gamma < 1$ and for every product $\tilde{\Pi} = \tilde{A}_{j_n} \cdots \tilde{A}_{j_1}$, $\tilde{A}_j \in \tilde{\mathcal{A}}$, which is not an s.m.p., it holds that $\rho(\tilde{\Pi}) < \gamma$.

We are now in the position to describe the ipa, which runs in two stages: Firstly, it guesses spectral maximizing products Π_n, $n = 1, \ldots, N$; Secondly, it tries to construct the unit ball P of a vector norm, for whose induced matrix norm all normalized matrices $\tilde{A}_j = A_j/\rho(\Pi_1)^{1/\mathrm{len}(\Pi_1)}$, $A_j \in \mathcal{A}$, have norm less than or equal to 1. If the second parts succeeds, then, by Inequality (6), we obtain the exact value of the joint spectral radius.

The construction of the set P is done iteratively. Starting with (properly scaled leading eigenvectors) of the s.m.p.-candidates, in each step it is checked whether all images of all points not yet mapped into the interior (of the convex hull of all formerly computed points) are mapped into the interior (of the convex hull of all formerly computed points). Depending on the structure of the input set, different convex hulls need to be used; *Case* (P): If all entries of the matrices A_j are non-negative, then we can take non-negative leading eigenvectors of the s.m.p.-candidates as starting vectors and use the cone hull co_+. *Case* (R): If the matrices A_j have positive and negative entries and all leading eigenvectors are real, then we use the symmetric convex hull co_s. *Case* (C): In all other cases we need to use the elliptic convex hull co_e. If eventually all points are mapped into the interior, then an invariant polytope is found and the algorithm terminates.

A simplified pseudo code implementation is given in Algorithm 1. For a more thorough discussion of the algorithm see [7, 8, 14]; For a discussion about the containment problem see [7, 17].
A crucial point in Algorithm 1 is the line **if** $r \notin \mathrm{co}_* V^\circ$ **then** : If we cannot proof that a vector r is not contained in the *interior* of $\mathrm{co}_* V$, then we have to add it to the set V. Otherwise we would not get rigorous results using this algorithm. Furthermore, with this procedure sufficient and necessary conditions for the termination of the ipa are known.

Algorithm 1: Invariant polytope algorithm

Data: irreducible, finite set of matrices $\mathcal{A} = \{A_j \in \mathbb{R}^{s\times s} : j = 1, \dots, J\}$
Result upon Termination: $\lambda = \mathrm{JSR}(\mathcal{A})$, invariant polytope $\mathrm{co}_* V$
Search for s.m.p.s $\Pi_1, \dots, \Pi_N$, set $\lambda := \rho(\Pi_1)^{1/\operatorname{len}\Pi_1}$
Scale matrices $\tilde{\mathcal{A}} := \{\lambda^{-1}A_j : j = 1, \dots, J\}$
Select leading eigenvectors $V := \{v_0, \dots, v_N\}$
Set $R_{new} := V$
while $R_{new} \neq \emptyset$ **do**
    Set $R := R_{new}$
    Set $R_{new} := \emptyset$
    for $r \in \tilde{\mathcal{A}}R$ **do**
        if $r \notin \mathrm{co}_* V^\circ$ **then**
            Set $V := V \cup r$
            Set $R_{new} := R_{new} \cup r$
Return λ, $\mathrm{co}_* V$

Theorem 2.1 ([8]). *Let $\mathcal{A} = \{A_j \in \mathbb{R}^{s\times s} : j = 1, \dots, J\}$ be a finite set of matrices. The ipa terminates if and only if the set $\mathcal{A}$*

- *has a spectral gap,*
- *has only finitely many s.m.p.s Π_n, $n = 1, \dots, N$ (up to powers and cyclic permutations), and*
- *each s.m.p. has only one simple leading eigenvector v_n (up to complex conjugates).*

2.1 Mixed numeric/symbolic computations

The conditions on the matrix set $\mathcal{A}$ in Theorem 2.1 sound rather restricting, but it turns out that most matrix families from applications fulfil them. Notable exceptions are when the scaled set $\tilde{\mathcal{A}}$ has a matrix product which is the identity matrix, or when vertices are mapped onto the boundary of the current polytope. In both cases the ipa cannot terminate, since the algorithm always checks whether images of vertices are mapped into the interior of the current polytope.

To overcome these problems one can revert to a symbolic computation of the norm. Unfortunately, a purely symbolic computation is computationally not feasible, because too expensive. Thus, we resort to a mixed numerical and symbolic algorithm to replace the aforementioned line in the algorithm with **if** $s \notin \mathrm{co}_* V$ **then** whenever possible. We distinguish between two cases.

Case 1: Whenever a new vertex point is near to an existing vertex point, we compare their exact coordinates symbolically. This can be done efficiently and just needs some matrix-vector multiplications.

Case 2: Slightly more complicated but still feasible; Whenever the norm of a new vertex is near 1, we compute an exact upper bound of its norm symbolically. This is efficiently possible whenever the leading eigenvectors are all real, i.e. in cases (R) and (P). Indeed, the problem of determining whether a point is inside or outside of a polytope can be stated as an LP problem [7], which does not only answer the containment problem, but also reports the vertices of a face of the polytope through which a ray through the point in question passes. This face can be used to symbolically compute an *upper* bound of the norm. For the case when one leading eigenvector is complex (case (C)) we yet do not have devised an efficient algorithm for the second problem.

Example 2.1 shows how mixed numeric/symbolic computation can be used to solve examples where vertices of the polytope are mapped onto other vertices.

Example 2.1. Let

$$A_1 = \frac{1}{\sqrt{2}}\begin{bmatrix} 0 & 0 & -1 \\ 0 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}, \quad A_2 = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 0 & -1 \\ 0 & 0 & -1 \\ -1 & 0 & -1 \end{bmatrix}.$$

The only s.m.p. of this set is given by A_2, see below for the proof. The ipa cannot compute the joint spectral radius of this set exactly due to two reasons: (1) The matrix A_2 has multiple leading eigenvalues ± 1, and furthermore (2), $A_2 = A_2^3$ and thus vertices of any polytope are mapped onto itself after three iterations.

With mixed symbolic and numeric computation we obtain that, with leading eigenvector $v_0 = \begin{bmatrix} \sqrt{2}+2 & \sqrt{2} & -2 \end{bmatrix}^T$, the polytope $P = \mathrm{co}_s\{v_0, A_1v_0, A_1A_1v_0, A_2A_1v_0, A_2A_2A_1v_0\}$ is invariant under both matrices A_1, A_2. See Figure 2 for the tree generated by the ipa.

Proof. We prove that A_2 is the only s.m.p. of the set $\{A_1, A_2\}$. First note that $\rho(A_2) = 1$. The claim follows by Gripenberg's algorithm [5]: Since the norm $\|A_1\|_2 = \sqrt{2}/2 < \rho(A_2)$, each product which is a candidate for an s.m.p. has to start with either $\cdots A_1A_2$ or $\cdots A_2A_2$, where

$$A_1A_2^1 = \frac{1}{2}\begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & -1 \end{bmatrix}, \quad \text{and} \quad A_2A_2^1 = \frac{1}{2}\begin{bmatrix} 2 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 0 & 2 \end{bmatrix}.$$

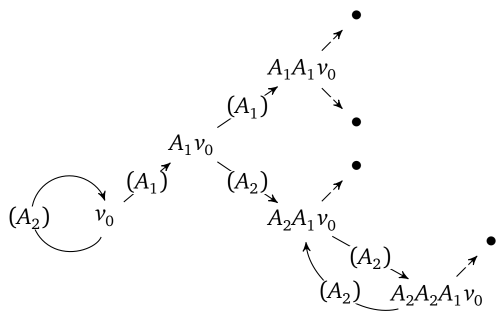

Figure 2: Tree generated by the ipa with mixed numeric/symbolic computations for Example 2.1. The starting vector v_0 is the leading eigenvector of A_2. Arrows depict how vertices are mapped under the given matrix product. Vertices plotted as • (instead written as text), are mapped to the interior of the polytope $P = \text{co}_s\{v_0, A_1v_0, A_1A_1v_0, A_2A_1v_0, A_2A_2A_1v_0\}$.

Again, $\|A_1A_2^1\|_2 = \sqrt{\frac{\sqrt{5}+3}{8}} \simeq 0.80902 < 1$, and thus each product which is a candidate for an s.m.p. has to start with either $\cdots A_1A_2^2$ or $\cdots A_2A_2^2$, where

$$A_1A_2^2 = \frac{1}{2\sqrt{2}}\begin{bmatrix} 0 & 0 & -2 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}, \quad \text{and} \quad A_2A_2^2 = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 0 & -1 \\ 0 & 0 & -1 \\ -1 & 0 & -1 \end{bmatrix}.$$

And again, the norm $\|A_1A_2^2\|_2 = \sqrt{\frac{\sqrt{5}+3}{8}} \simeq 0.80902 < 1$, and thus each product which is a candidate for an s.m.p. has to start with either $\cdots A_1A_2^3$ or $\cdots A_2A_2^3$. Since $A_1A_2^3 = A_1A_2^1$ and $A_2A_2^3 = A_2A_2^1$ we conclude that all s.m.p. candidates are of the form $A_1A_2^n$ and $A_2A_2^n$. The former are no s.m.p.s, since their spectral radii is 1/2, thus A_2 is the only s.m.p.. □

2.2 Limit matrices

In some cases it speeds up the computation when one adds matrices to the input set $\mathcal{A}$ in question. In particular, given a set of matrices $\mathcal{A}$, its joint spectral radius $\text{JSR}(\mathcal{A})$ does not change when elements of the closure $\text{cl}\,\mathcal{A}$ or its convex hull $\text{co}\,\mathcal{A}$ (to be understood in the Hausdorff distance using a matrix norm) are added to $\mathcal{A}$ [10, Proposition 1.8],

$$\text{JSR}(\mathcal{A}) = \text{JSR}(\text{cl}\,\mathcal{A}) = \text{JSR}(\text{co}\,\mathcal{A}). \quad (7)$$

Lemma 2.2 shows that we may also add limit matrices to the set in question.

Lemma 2.2. *Given matrices $\tilde{A} \subseteq \mathbb{R}^{s\times s}$ with $\text{JSR}(\tilde{A}) = 1$; If the ipa terminates for the set $\tilde{A}$, then the ipa terminates for the set $\mathcal{L} \cup \tilde{A}$, where $\mathcal{L}$ is the set of all matrices of the limit set of all possible products of matrices of $\tilde{A}$, i.e. of the set $\left\{\prod_{k=1}^n \tilde{A}_{j_k} : n \in \mathbb{N},\ \tilde{A}_j \in \tilde{A}\right\}$.*

Proof. If the ipa terminates, then there exists $K \in \mathbb{N}$ such that $\tilde{A}_j v_n \in \text{co}_* V$ for all $\tilde{A}_j \in \tilde{A}$ with $V = \bigcup_{k=0}^K \tilde{A}^k\{v_1, \dots, v_N\}$, where v_n, $n = 1, \dots, N$, are the starting vectors for the ipa. Thus, for each $v_n \in V$, there exists $M \in \mathbb{N}$ such that $\tilde{\Pi}_j^m v \in \text{co}_* V$ for all $m \geq M$ and all s.m.p.s $\tilde{\Pi}_j$. In particular, $\tilde{\Pi}_l v \in \text{co}_* V$ for all $\tilde{\Pi}_l \in \mathcal{L}$. □

Currently we use a heuristic to decide whether to add matrices and which of them. The according rules have not stabilized yet, and thus, we do not report them.

3 The finiteness conjecture

Recalling the definition of a spectral maximizing product (s.m.p.) in Section 2, we make the following definition:

Definition 3.1. A bounded set of matrices $\mathcal{A} \subseteq \mathbb{R}^{s\times s}$ is said to posses the *finiteness property* if there exists a finite product $\Pi = A_{j_n} \cdots A_{j_1}$, $A_{j_i} \in \mathcal{A}$ such that $\rho(\Pi)^{1/n} = \text{JSR}(\mathcal{A})$.

As already mentioned in the beginning, it has been shown that there exist sets of matrices such that the normalized spectral radius of every finite product is strictly less than the JSR. In other words, not all sets of matrices posses an s.m.p.. It is an open question whether pairs of *binary matrices* with entries $\{0, 1\}$ or *sign matrices* with entries $\{-1, 0, 1\}$ always posses an s.m.p. [11, 10]. Using the ipa we can check special cases of this question.

Theorem 3.1. *The finiteness conjecture holds for all pairs of*

(a) *binary matrices of dimension 2 (i.e. with entries $\{0, 1\}$),*

(b) *sign matrices of dimension 2 (i.e. with entries $\{-1, 0, 1\}$), and*

(c) *binary matrices of dimension 3 (i.e. with entries $\{0, 1\}$).*

Remark 1. Point 3.1 (a) is already proven in [10, Chapter 4]; Point 3.1 (b) is already proven in [3].

Proof. With our proposed algorithm a proof of (a) and (b) takes some minutes. The proof of 3.1 (c) takes two days (CPU: AMD Ryzen 3600, 6 cores, 64 GB RAM) . The used scripts to proof the results can be found at *gitlab.com/tommsch/dolomites* (and/or *tommsch.com/science.php*) and are named `fc_2.m`, `fc_2s.m`, `fc_3.m`. The results in condensed form are tabulated in the Appendix; in more detail they can be found online. □

Remark 2. If the algorithm would be implemented in a performant language (like C), this approach of checking the finiteness conjecture could also be used for pairs of sign matrices of dimension 3, of which there are approximately 20 million cases to be checked. For larger matrices, this approach is not feasible any more.

3.1 Diminishing the number of cases

To proof 3.1 (c) we have to consider $2^{18} = 262144$ cases (To proof (b) we have to consider $3^8 = 6561$ cases, for (a) $2^8 = 256$ cases). This number can be reduced significantly: For some sets of matrices a concrete s.m.p. is known, other sets share certain symmetries, so that in total we check 15908 cases (For (b) we check 166 cases, for (a) we check 6 cases). We could exploit even more symmetries, but since those are computational hard to check, the total time needed to proof the statement most likely would increase.

Lemma 3.2. *Given $A_1, A_2 \in \mathbb{R}^{s\times s}$; The following pairs have the same joint spectral radius and the finiteness property holds for all or none of them:*

- $\{A_1, A_2\}$,
- $\{A_2, A_1\}$,
- $\{A_1^T, A_2^T\}$,
- $\{\pm A_1, \pm A_2\}$,
- $\{P^T A_1 P, P^T A_2 P\}$ *where P is a permutation matrix, and*
- $\{S^{-1} A_1 S, S^{-1} A_2 S\}$ *where S is an invertible matrix.*

Proof. For the proof we use the definition of the joint spectral radius 1.1 with the 2-norm. The statements then follow from the facts that $\|A\|_2 = \|A^T\|_2 = \|-A\|_2$ and $PP^T = SS^{-1} = I$. □

Lemma 3.3. *Given $A_1, A_2, A_0 \in \mathbb{N}_0^{s\times s}$; If $A_2 \leq A_1$, then* $\mathrm{JSR}(\{A_2, A_0\}) \leq \mathrm{JSR}(\{A_1, A_0\})$.

Proof. For the proof we use the definition of the joint spectral radius 1.1 with the Frobenius norm $\|\cdot\|_F$, and let $X = A_{j_n} \cdots A_{j_1}$, $j_i \in \{2, 0\}$, be a given product. We first construct a new product $\tilde{X} = A_{\tilde{j}_n} \cdots A_{\tilde{j}_1}$, $\tilde{j}_i \in \{1, 0\}$, from X, by replacing all occurrences of A_2 by A_1. It follows that $\|X\|_F^{1/n} \leq \|\tilde{X}\|_F^{1/n}$, and thus $\mathrm{JSR}(\{A_2, A_0\}) \leq \mathrm{JSR}(\{A_1, A_0\})$. □

Lemma 3.4. *Given $A_1, A_2 \in \mathbb{N}_0^{s\times s}$; The finiteness property holds whenever* $\mathrm{JSR}(\{A_1, A_2\}) \leq 1$.

Proof. Since the norm of a non-zero integer matrix is always greater equal than one, it is not possible that the joint spectral radius of a set of integer matrices is strictly between 0 and 1. If $\mathrm{JSR}(\{A_1, A_2\}) = 0$, then clearly both A_1 and A_2 are s.m.p.s. The second case is non trivial and its proof is given in [10, Chapter 3.4]. □

Corollary 3.5. *Given $A_1, A_2 \in \mathbb{N}_0^{s\times s}$; The finiteness property holds whenever*

(a) $A_2 \leq A_1$

(b) $A_1 A_2 \leq A_1^2$

(c) $A_2 \leq I$

(d) $A_2 A_1 \leq A_1 A_2$

Proof. Again, we use the definition of the joint spectral radius 1.1 with the Frobenius norm $\|\cdot\|_F$, and let $A_{j_n} \cdots A_{j_1}$, $j \in \{1, 2\}$, be a given product.

(a) and (b) It follows that $\|A_{j_n} \cdots A_{j_1}\|_F^{1/n} \leq \|A_1\|_F^{1/n}$, and thus $\mathrm{JSR}(\{A_1, A_2\}) = \rho(A_1)$

(c) It follows that $\|A_{j_n} \cdots A_{j_1}\|_F^{1/n} \leq \|A_1\|_F^{1/\tilde{n}}$ with $\tilde{n} \leq n$, and thus, $\mathrm{JSR}(\{A_1, A_2\}) \leq \rho(A_1)$ which implies $\mathrm{JSR}(\{A_1, A_2\}) = \rho(A_1)$.

(d) It follows that $\|A_{j_n} \cdots A_{j_1}\|_F^{1/n} \leq \|A_1^{n_1} A_2^{n_2}\|_F^{1/n}$ for some $n_1 + n_2 = n$, and thus, $\mathrm{JSR}(\{A_1, A_2\}) = \max\{\rho(A_1), \rho(A_2)\}$. □

Lemma 3.6. *If there exists a norm $\|\cdot\|$ such that $\max\{\rho(A_1), \rho(A_2)\} = \max\{\|A_1\|, \|A_2\|\}$, then the finiteness property holds. In particular, the finiteness property holds for sets of normal matrices, and thus, symmetric matrices. A matrix A is normal, iff $A^T A = AA^T$.*

Proof. The first part follows from Inequality (6), which reads for products of length 1 as $\max_{A_j \in \mathcal{A}} \rho(A_j) \leq \mathrm{JSR}(\mathcal{A}) \leq \max_{A_j \in \mathcal{A}} \|A_j\|$. By the assumptions we have equality here, and thus $\mathrm{JSR}(\{A_1, A_2\}) = \max_{A_j \in \mathcal{A}} \rho(A_j)$.

The second parts about normal matrices follows now by using the 2-norm, which equals the matrix' the largest singular value. For normal matrices the largest singular value equals the largest eigenvalue in magnitude, and thus $\max_{A_j \in \mathcal{A}} \rho(A_j) = \max_{A_j \in \mathcal{A}} \|A_j\|_2$. □

Definition 3.2. Given a finite set of matrices $\mathcal{A} \subseteq \mathbb{R}^{s\times s}$; If there exists $V \in \mathbb{R}^{s\times s}$ such that $VA_jV^{-1} = \begin{bmatrix} B_j & C_j \\ 0 & D_j \end{bmatrix}$ for all $A_j \in \mathcal{A}$, then $\mathcal{A}$ is *reducible*.

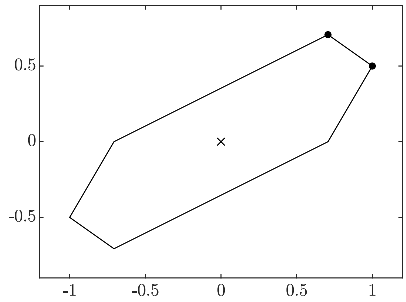

Figure 3: Invariant polytope for the matrices $A_1 = \left[\begin{smallmatrix}0&1\\0&1\end{smallmatrix}\right]$, $A_2 = \left[\begin{smallmatrix}1&0\\1&-1\end{smallmatrix}\right]$. of Example 4.1. The cross × denotes the origin, the dots • the leading eigenvectors of the matrices (and s.m.p.s) A_1 and A_2.

Theorem 3.7. *In the notation from Definition 3.2; If $\mathcal{A}$ is reducible, then* $\mathrm{JSR}(\mathcal{A}) = \max\{\mathrm{JSR}(\mathcal{B}), \mathrm{JSR}(\mathcal{D})\}$, $\mathcal{B} = \{B_j : j = 1, \dots, J\}$, $\mathcal{D} = \{D_j : j = 1, \dots, J\}$.

The first rigorous proof known to the author can be found in [10, Proposition 1.5]. Although the proof is straight forward, it is also rather technical and we abstain from giving it here.

Corollary 3.8. *Given $A_1, A_2 \in Z^{s\times s}$, $Z \subseteq \mathbb{Z}$ and using the notation from Definition 3.2; The finiteness conjecture holds whenever there exists $S \in \mathbb{C}^{s\times s}$ such that the matrices $S^{-1}A_jS$, have joint block diagonal form with blocks $B_j \in Z^{s_B\times s_B}$, $D_j \in Z^{s_D\times s_D}$, $j = 1, 2$, $s_B < l$, and the finites property holds for all pairs of matrices in $Z^{s_B\times s_B}$.*

Proof. This follows from Lemma 3.2 and Theorem 3.7. □

4 Implementation notes

Our Matlab implementation of the algorithm can be found on Gitlab [15], and is extensively documented. The file `manual.pdf` gives an overview of the toolbox, in depth documentation can be found directly in the source files, and can be viewed by typing `help functionname` or `edit functionname`, e.g. `help tjsr` or `edit tjsr`, in Matlab.

The main function for the JSR computation is `tjsr`, short for *invarianT polyTope algoriThm*. Depending on the input, our implementation chooses its parameters automatically and usually there is no need for the user to specify options by hand. For example, of the 15910 cases checked for Theorem 3.1 (c), manual intervention was only necessary for 2 cases.

Example 4.1 presents how to use the `tjsr` algorithm.

Example 4.1. Given the matrices $A_1 = \left[\begin{smallmatrix}0&1\\0&1\end{smallmatrix}\right]$, $A_2 = \left[\begin{smallmatrix}1&0\\1&-1\end{smallmatrix}\right]$. To compute their joint spectral radius, the matrices must be passed as a cell array to the algorithm, e.g. by typing:

```
tjsr( {[0 1;0 1],[1 0;1 -1]} )
```

The algorithm (version 1.2022.05.25) produces the following output:

```
Input: 2 matrices of dimension 2

A lot of candidates found. Nearly all orderings are smp's.
Set <'epseigenplane',inf, 'epsspectralradius',inf, 'maxsmpdepth',5, 'balancing',-1, 'ncdelta',1>.
JSR (of block) 1:     1.0000    1.6180
Duplicate leading eigenvectors occured. Enable symbolic computation. Set <'epssym',5e-12>.
JSR (of block) 1:     1.0000    1.6180
Case (R).
Selected candidates: | 1 | 2 |
Number of vertices: 2 ( candidates )
Balance 2 Trees. Balancing vector found: [ 1, 341/305]
JSR = [              1,   1.61803398875 ], norm=          Inf, #test: 1/1, #V:2/2 | 0
JSR = [              1,   1.61803398875 ], norm= 2.41421508763, _
Number of vertices of polytope: 3
Products which give lower bounds of JSR: | 1 |
Algorithm terminated correctly. Exact value found.
JSR =              1
```

One can see that the algorithm restarts two times. The first time because two many s.m.p. candidates are found and appropriate options are set: `<'epseigenplane',inf, 'epsspectralradius',inf, 'maxsmpdepth',5, 'balancing',-1, 'ncdelta',1>`. The second time because the s.m.p. candidates do not have a unique leading eigenvector and mixed symbolic and numeric computation is enabled `<'epssym',5e-12>`.

The third time the algorithm terminates after two iterations. It reports two s.m.p.s A_1 and A_2, and a joint spectral radius of 1. The constructed polytope with 3 vertices is given in Figure 3. The figure is produced by calling `tjsr` with the option `'plot'`: `tjsr( [0 1;0 1],[1 0;1 -1], 'plot','polytope' )`. A complete list of all options can be found in the file `tjsr_option`, and viewed by typing `tjsr help` or `edit tjsr_option`.

Remark 3. Since our implementation of the algorithm is in Matlab, which has very restricted capabilities for symbolic computations, mixed symbolic computation only works when the leading eigenvectors are expressible in a “simple” closed form, e.g. for integer matrices of dimension less than or equal to 3.

A List of cases

A.1 2 × 2 binary matrices

The following list reports $\mathcal{A}$: the set of matrices and *s.m.p.*: the shortest s.m.p. found for the set $\mathcal{A}$. All unreported cases can be reduced to a simpler one, or an s.m.p. is known due to the structure of the set $\mathcal{A}$, by the Lemmata presented in Section 3.1.

$\mathcal{A}$	*s.m.p.*	$\mathcal{A}$	*s.m.p.*	$\mathcal{A}$	*s.m.p.*
$\{\begin{bmatrix}0&1\\0&0\end{bmatrix},\begin{bmatrix}1&0\\1&1\end{bmatrix}\}$	$A_1A_2^4$	$\{\begin{bmatrix}0&1\\1&0\end{bmatrix},\begin{bmatrix}1&1\\0&1\end{bmatrix}\}$	$A_1A_2^3$	$\{\begin{bmatrix}0&1\\0&1\end{bmatrix},\begin{bmatrix}0&0\\1&1\end{bmatrix}\}$	A_1A_2
$\{\begin{bmatrix}1&1\\0&1\end{bmatrix},\begin{bmatrix}1&0\\1&0\end{bmatrix}\}$	$A_1^2A_2$	$\{\begin{bmatrix}0&1\\0&1\end{bmatrix},\begin{bmatrix}1&0\\1&1\end{bmatrix}\}$	$A_1A_2^2$	$\{\begin{bmatrix}1&1\\0&1\end{bmatrix},\begin{bmatrix}1&0\\1&1\end{bmatrix}\}$	A_1A_2

A.2 2 × 2 sign matrices

To save space, we use the following abbreviations: $+$ for $+1$, $-$ for -1, $\circ$ for 0. In addition to $\mathcal{A}$ and *s.m.p.*, as reported in Section A.1, we mark all cases where at least one leading eigenvalues is complex (case (C)). If the case is not explicitly mentioned, then it is case (R), meaning that all leading eigenvalues are real.

$\mathcal{A}$	*s.m.p.*	*case*
$\{\begin{bmatrix}\circ&\circ\\\circ&+\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_2	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\\circ&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	$A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\\circ&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&\circ\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	$A_1^2A_2A_1A_2^2A_1A_2$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\\circ&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1A_2A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1^4A_2^4$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&\circ\end{bmatrix}\}$	$A_1^5A_2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}+&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1A_2^2$	

$\mathcal{A}$	*s.m.p.*	*case*
$\{\begin{bmatrix}\circ&\circ\\\circ&+\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	A_2	(C)
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}\circ&\circ\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}\circ&+\\+&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\+&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\\circ&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1^2A_2A_1A_2^2A_1A_2$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1^4A_2^4$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	$A_1^4A_2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	

$\mathcal{A}$	*s.m.p.*	*case*
$\{\begin{bmatrix}\circ&\circ\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_2	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^5$	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\+&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\+&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&+\\\circ&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\\circ&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\\circ&\circ\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1A_2^2A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\\circ&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\\circ&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}+&\circ\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1^3A_2^2$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	$A_1^4A_2$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\-&\circ\end{bmatrix}\}$	A_2	

$\mathcal{A}$	*s.m.p.*	*case*
$\{\begin{bmatrix}\circ&\circ\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}\circ&+\\+&\circ\end{bmatrix},\begin{bmatrix}+&+\\\circ&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	$A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&+\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	$A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&\circ\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\\circ&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1A_2A_1A_2A_1A_2^2$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\\circ&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1A_2^2A_1A_2^3$	
$\{\begin{bmatrix}+&\circ\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	$A_1^4A_2$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\+&-\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1^2A_2A_1A_2A_1A_2$	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	

$\mathcal{A}$	*s.m.p.*	*case*
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}\circ&-\\+&+\end{bmatrix}\}$	A_2	(C)
$\{\begin{bmatrix}\circ&+\\\circ&\circ\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}\circ&-\\+&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&+\end{bmatrix}\}$	$A_1A_2^5$	
$\{\begin{bmatrix}\circ&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}\circ&+\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\\circ&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}\circ&-\\+&\circ\end{bmatrix},\begin{bmatrix}+&-\\\circ&+\end{bmatrix}\}$	$A_1A_2^4$	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&+\\\circ&\circ\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\\circ&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&+\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\\circ&\circ\end{bmatrix}\}$	$A_1^2A_2$	
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&-\\\circ&-\end{bmatrix}\}$	A_1	(C)
$\{\begin{bmatrix}\circ&-\\+&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1^2A_2^3$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\+&-\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&\circ\end{bmatrix}\}$	$A_1^5A_2$	
$\{\begin{bmatrix}+&+\\\circ&+\end{bmatrix},\begin{bmatrix}+&+\\-&-\end{bmatrix}\}$	$A_1^4A_2$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\+&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\-&+\end{bmatrix}\}$	$A_1A_2^3$	
$\{\begin{bmatrix}+&+\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\-&-\end{bmatrix}\}$	A_2	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&-\\+&\circ\end{bmatrix}\}$	$A_1^3A_2^2$	
$\{\begin{bmatrix}+&-\\\circ&+\end{bmatrix},\begin{bmatrix}+&\circ\\-&-\end{bmatrix}\}$	$A_1^3A_2$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&\circ\\+&\circ\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&-\\+&+\end{bmatrix}\}$	$A_1A_2^2$	
$\{\begin{bmatrix}+&-\\\circ&-\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	A_1A_2	
$\{\begin{bmatrix}+&+\\+&-\end{bmatrix},\begin{bmatrix}+&-\\+&-\end{bmatrix}\}$	A_1	
$\{\begin{bmatrix}+&-\\+&-\end{bmatrix},\begin{bmatrix}+&+\\-&\circ\end{bmatrix}\}$	A_1A_2	

A.3 3 × 3 binary matrices

Due to the large number of cases and the need to save space, we give the matrices as a pair of two numbers, where the binary representation of the numbers corresponds to the entries in the matrices. The rightmost digit in the binary representation corresponds to the entry in the second matrix, third row, third column. For example, the pair 3/477, written in the binary system as $000'000'011_2/111'011'101_2$ corresponds to the matrix pair $3/477 \triangleq 000'000'011_2/111'011'101_2 \triangleq \left\{\begin{bmatrix}0&0&0\\0&0&1\\0&0&1\end{bmatrix},\begin{bmatrix}1&0&1\\1&1&0\\1&1&1\end{bmatrix}\right\}$. Matrix pairs with the same s.m.p. are subsumed under one entry. For example, the s.m.p. A_2 of the matrix pair 3/477 can be found in the section with $\boxed{\mathbf{A_1 = 3}}$ and the cell with the entry $\boxed{476-78,\ A_2}$.

$\mathbf{A_1 = 2}$	77 A_2	92 $A_1A_2^5$	93 A_2	101 A_2	104 A_1A_2	105 $A_1A_2^2$	108–9 A_2	113 $A_1A_2^5$	116 $A_1A_2^6$	117 A_2	120 $A_1A_2^2$
121 $A_1A_2^3$	124 $A_1A_2^4$	125 $A_1A_2^7$	141 A_2	156–57 A_2	169 $A_1A_2^5$	172–73 A_2	184–85 A_2	188–89 A_2	204–5 A_2	220–21 A_2	225 $A_1A_2^6$
228–29 A_2	232 A_2	233 $A_1A_2^4$	236–37 A_2	240–41 A_2	244–45 A_2	248 A_2	249 $A_1A_2^7$	252–53 A_2	332–33 A_2	348–49 A_2	352 A_2
353 $A_1A_2^5$	356–57 A_2	360 A_2	361 $A_1A_2^4$	364–65 A_2	368 $A_1A_2^5$	369 $A_1A_2^6$	372–73 A_2	376–377 $A_1A_2^4$		380–81 A_2	396–97 A_2
412–13 A_2	424–25 A_2	428–29 A_2	440–41 A_2	444–45 A_2	460–61 A_2	476–77 A_2	480–81 A_2	484–85 A_2	488–89 A_2	492–93 A_2	496–97 A_2
500–1 A_2	504–5 A_2	508–9 A_2	$\mathbf{A_1 = 3}$	76 A_1	77–78 A_2	92 $A_1A_2^2$	93 $A_1A_2^6$	94 A_2	97 $A_1A_2^2$	100 $A_1A_2^2$	101–2 A_2
104 A_1	105 $A_1A_2^2$	106 A_2	108 $A_1A_2^2$	109–10 A_2	113 $A_1A_2^4$	114 A_2	116 $A_1A_2^2$	117–18 A_2	120–121 $A_1A_2^2$		122 A_2
124 $A_1A_2^2$	125 $A_1A_2^4$	126 A_2	141–42 A_2	156–58 A_2	169 A_1A_2	170 A_2	172–74 A_2	184–86 A_2	188–90 A_2	204–6 A_2	220–22 A_2
225 $A_1A_2^2$	226 A_2	228–30 A_2	232 A_1	233 $A_1A_2^2$	234 A_2	236–38 A_2	240–42 A_2	244–46 A_2	248 A_2	249 $A_1A_2^6$	250 A_2
252–54 A_2	332–34 A_2	348–50 A_2	352 A_1	353 $A_1A_2^4$	354 A_2	356–58 A_2	360 A_1	361 $A_1A_2^2$	362 A_2	364–66 A_2	
368–369 $A_1A_2^5$		370 A_2	372–74 A_2	376 $A_1A_2^4$	377 $A_1A_2^3$	378 A_2	380–82 A_2	396–98 A_2	412–14 A_2	424–26 A_2	428–30 A_2
440–42 A_2	444–46 A_2	460–62 A_2	476–78 A_2	480–82 A_2	484–86 A_2	488–90 A_2	492–94 A_2	496–98 A_2	500–2 A_2	504–6 A_2	508–10 A_2

$A_1 = 6$	72–74	A_1A_2	75 A_2	88 A_1A_2	89 $A_1A_2^2$	90–91 A_2	92 A_1A_2	93 A_2	97 $A_1A_2^2$	99–1 A_2	104 A_1A_2
105 $A_1A_2^2$	106 A_1A_2	107 A_2	108 A_1A_2	109 A_2	113 $A_1A_2^4$	114–15 A_2	116 $A_1A_2^5$	117 A_2	120 A_1A_2	121 $A_1A_2^2$	122–23 A_2
124 A_1A_2	125 $A_1A_2^5$	152 $A_1A_2^2$	153 $A_1A_2^3$	154–57 A_2	169 $A_1A_2^4$	170–73 A_2	184 A_2	185 $A_1A_2^7$	186–89 A_2	216 A_1A_2	217 $A_1A_2^2$
218–21 A_2	232 A_1A_2	233 $A_1A_2^2$	234–35 A_2	240–45 A_2	248 A_2	249 $A_1A_2^4$	250–53 A_2	344 A_1A_2	345 $A_1A_2^2$	346–47 A_2	
368–369	$A_1A_2^4$	370–73 A_2	376 $A_1A_2^2$	377 $A_1A_2^3$	378–81 A_2	440–45 A_2	504–7 A_2	**$A_1 = 7$**	72–75	A_1A_2	78 A_2
88–89	A_1A_2	90–91 A_2	92–93	A_1A_2	94 A_2	97 $A_1A_2^2$	99 A_2	100 $A_1A_2^2$	101–2 A_2	104–106	A_1A_2
107 A_2	108–109	A_1A_2	110 A_2	113 $A_1A_2^2$	114–15 A_2	116 $A_1A_2^2$	117 $A_1A_2^6$	118 A_2	120–121	A_1A_2	122–23 A_2
124 $A_1A_2^2$	125 $A_1A_2^3$	126 A_2	152–153	$A_1A_2^2$	154–58 A_2	169 $A_1A_2^2$	170–74 A_2	184 A_2	185 $A_1A_2^6$	186–90 A_2	
216–217	A_1A_2	218–22 A_2	232–233	A_1A_2	234–35 A_2	238 A_2	240–46 A_2	248 A_2	249 $A_1A_2^3$	250–54 A_2	
344–345	A_1A_2	346–47 A_2	350 A_2	368 $A_1A_2^4$	369 $A_1A_2^3$	370–74 A_2	376–377	$A_1A_2^2$	378–79 A_2	380 $A_1A_2^6$	381–82 A_2
440–46 A_2	504–7 A_2	510 A_2	**$A_1 = 10$**	71 A_2	86 $A_1A_2^5$	87 A_2	99 A_2	101–3 A_2	104 A_1	105 $A_1A_2^2$	108 A_1
109 A_2	113 $A_1A_2^5$	114–15 A_2	116 $A_1A_2^4$	117–19 A_2	120 $A_1A_2^2$	121 $A_1A_2^3$	124 $A_1A_2^2$	125 $A_1A_2^7$	230–31 A_2	247 A_2	326–27 A_2
342–43 A_2	352 A_1	353 $A_1A_2^5$	354–59 A_2	360 A_1	361 $A_1A_2^4$	364–65 A_2	368 $A_1A_2^5$	369 $A_1A_2^6$	370 A_2	372–75 A_2	
376–377	$A_1A_2^4$	380–81 A_2	486–87 A_2	503 A_2	**$A_1 = 11$**	70–71 A_1	86 A_1	87 $A_1A_2^4$	96–97 A_1	99–2 A_1	103 A_2
104–6 A_1	108–10 A_1	112–14 A_1	115 A_2	116–18 A_1	119 A_2	120–21 A_1	122 A_2	124 A_1	125 $A_1A_2^2$	126 A_2	162–67 A_1
172–74 A_1	178–82 A_1	183 $A_1A_2^4$	188–90 A_2	230 A_1	231 A_2	246–47 A_2	326 A_1	327 A_2	342 A_1	343 A_2	352–54 A_1
355 A_2	356 A_1	357–59 A_2	360–62 A_1	364 A_1	365–66 A_2	368–69 A_1	370 A_2	372 A_1	373–75 A_2	376 A_1	377 $A_1A_2^3$
378 A_2	380 A_1	381–82 A_2	418–23 A_1	428–30 A_2	434–39 A_2	444–46 A_2	486–87 A_2	502–3 A_2	**$A_1 = 12$**	67 $A_1A_2^2$	71 A_2
75 A_2	83 $A_1A_2^3$	86 $A_1A_2^4$	87 A_2	90–91 A_2	99 A_2	102–3 A_2	106–7 A_2	114–15 A_2	118–19 A_2	122–23 A_2	131 A_1A_2
134–135	A_1A_2	139 A_2	147 $A_1A_2^3$	149 $A_1A_2^5$	150 $A_1A_2^2$	151 $A_1A_2^3$	152 A_2	153 $A_1A_2^5$	154–55 A_2	163 A_1A_2	165 $A_1A_2^6$
166 A_2	167 $A_1A_2^3$	169 $A_1A_2^6$	170–71 A_2	176–82 A_2	183 $A_1A_2^7$	184–87 A_2	193 A_1A_2	194	$A_1^2A_2A_1A_2A_1A_2$		195 A_1A_2
197 A_2	198	$A_1A_2A_1A_2^2$	199 A_2	200–201	A_1A_2	202	$A_1A_2A_1A_2^2$	203 A_2	208 A_2	209 A_1A_2	
210	$A_1^2A_2A_1A_2^2$	211 $A_1A_2^2$	212 $A_1A_2^4$	213 A_2	214 $A_1A_2^2$	215 $A_1A_2^5$	216 A_2	217 $A_1A_2^3$	218–19 A_2	225 A_1A_2	226–32 A_2
233 $A_1A_2^3$	234–35 A_2	240–51 A_2	323 $A_1A_2^3$	326–27 A_2	330 $A_1A_2^4$	331 A_2	338 $A_1^2A_2^6$	339 $A_1A_2^3$	342–43 A_2	346–47 A_2	354–55 A_2
358–59 A_2	362–63 A_2	370–71 A_2	374–75 A_2	378–79 A_2	386 A_2	387 A_1A_2	388 A_2	389 $A_1A_2^5$	390 A_2	391 $A_1A_2^3$	393 $A_1A_2^5$
394 $A_1A_2^4$	395 A_2	400–402	$A_1^2A_2^4$	403 $A_1A_2^2$	404 $A_1^2A_2^4$	405 $A_1A_2^5$	406–407	$A_1A_2^4$	408 $A_1^2A_2^4$	409 $A_1A_2^5$	410–11 A_2
416–27 A_2	432–43 A_2	449 $A_1A_2^3$	450	$A_1^2A_2^2A_1A_2$	451 $A_1A_2^2$	452–55 A_2	456 $A_1A_2^2$	457 $A_1A_2^3$	458 $A_1A_2^2$	459 $A_1A_2^5$	464 $A_1^2A_2^4$
465 $A_1A_2^2$	466 $A_1^2A_2^4$	467 $A_1A_2^2$	468–71 A_2	472–473	$A_1A_2^4$	474–75 A_2	480–88 A_2	489 $A_1A_2^7$	490–91 A_2	496–7 A_2	**$A_1 = 13$**
66 $A_1^2A_2$	67 A_1A_2	70 $A_1^2A_2$	71 A_2	74 $A_1^2A_2$	75 A_2	78 A_2	82 $A_1^2A_2$	83 A_1A_2	86 $A_1A_2^2$	87 $A_1A_2^3$	90–91 A_2
94 A_2	98 $A_1^2A_2$	99 A_1A_2	102–3 A_2	106–7 A_2	110 A_2	114–15 A_2	118–19 A_2	122–23 A_2	126 A_2	128 A_1	129 A_1A_2
130 $A_1^2A_2$	131 A_1A_2	132 A_1	133 A_1A_2	134 $A_1^2A_2$	135 A_1A_2	136 A_1	137 A_1A_2	138 $A_1^2A_2$	139 A_2	140 $A_1^2A_2^2$	142 $A_1A_2^2$
144 A_1	145 A_1A_2	146 $A_1^2A_2$	147 A_1A_2	148 $A_1^2A_2^2$	149 $A_1A_2^3$	150 $A_1^2A_2^2$	151 $A_1A_2^2$	152 $A_1^2A_2^2$	153 $A_1A_2^3$	154–56 A_2	158 A_2
160 A_1	161 A_1A_2	162 $A_1^2A_2$	163 A_1A_2	164 A_1	165 A_1A_2	166 $A_1^2A_2$	167 A_1A_2	168 A_1	169 A_1A_2	170–72 A_2	174 A_2
176–82 A_2	183 $A_1A_2^5$	184–88 A_2	190 A_2	192 $A_1^2A_2$	193 A_1A_2	194 $A_1^2A_2$	195 A_1A_2	196 $A_1^2A_2$	197 A_2	198 $A_1^2A_2$	199 A_1A_2
200 $A_1^2A_2$	201 A_1A_2	202 $A_1^2A_2$	203 A_1A_2	204 $A_1A_2^2$	206 A_2	208 $A_1^2A_2$	209 A_1A_2	210 $A_1^2A_2$	211 A_1A_2	212 $A_1A_2^2$	213 $A_1A_2^5$
214–215	$A_1A_2^2$	216 $A_1^2A_2$	217 A_1A_2	218–20 A_2	222 A_2	224 $A_1^2A_2$	225 A_1A_2	226 $A_1^2A_2$	227 A_1A_2	228–31 A_2	232 $A_1^2A_2$
233 A_1A_2	234–36 A_2	238 A_2	240–52 A_2	254 A_2	322 $A_1^2A_2$	323 A_1A_2	326–27 A_2	330 $A_1A_2^2$	331 $A_1A_2^3$	334 A_2	338 $A_1^2A_2^3$
339	$A_1A_2A_1A_2^2$	342–43 A_2	346–47 A_2	350 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366 A_2	370–71 A_2	374–75 A_2	378–79 A_2
382 A_2	384 A_1	385 A_1A_2	386 $A_1^2A_2$	387 A_1A_2	388 $A_1^2A_2^2$	389 $A_1A_2^3$	390 $A_1^2A_2$	391 A_1A_2	392 $A_1^2A_2^2$	393 $A_1A_2^3$	394 $A_1A_2^2$
395 $A_1A_2^5$	396 A_2	398 A_2	400 $A_1^2A_2^4$	401–402	$A_1^2A_2^3$	403 A_1A_2	404 $A_1^2A_2^4$	405 $A_1A_2^5$	406 $A_1^2A_2^3$	407 $A_1A_2^3$	408 $A_1^2A_2^4$
409 $A_1A_2^5$	410–12 A_2	414 A_2	416–28 A_2	430 A_2	432–44 A_2	446 A_2	448 $A_1^2A_2$	449 A_1A_2	450 $A_1^2A_2$	451 A_1A_2	452–55 A_2
456 $A_1^2A_2^2$	457–459	$A_1A_2^2$	460 A_2	462 A_2	464 $A_1^2A_2^3$	465 A_1A_2	466 $A_1^2A_2^2$	467 A_1A_2	468–69 A_2	470 $A_1^2A_2^5$	471 A_2
472 $A_1^2A_2^3$	473 $A_1A_2^3$	474 $A_1^2A_2^5$	475–76 A_2	478 A_2	480–88 A_2	489 $A_1A_2^5$	490–92 A_2	494 A_2	496–8 A_2	510 A_2	**$A_1 = 14$**
65 A_1	67 $A_1A_2^2$	69 A_2	71 A_2	72–74	A_1A_2	75 A_2	76 A_1A_2	77 A_2	81 A_1A_2	82	$A_1^2A_2A_1A_2^2$
83 $A_1A_2^2$	85 A_2	86 $A_1A_2^2$	87 A_2	88–89	A_1A_2	90–91 A_2	92 A_1A_2	93 A_2	97 $A_1A_2^2$	99 A_2	100 A_1
101–3 A_2	104 A_1A_2	105 $A_1A_2^2$	106 A_1A_2	107 A_2	108 A_1A_2	109 A_2	113 $A_1A_2^3$	114–15 A_2	116 $A_1A_2^5$	117–19 A_2	120 A_1A_2
121 $A_1A_2^2$	122–23 A_2	124 A_1A_2	125 $A_1A_2^4$	130 A_1	131 A_1A_2	134 A_1	135 A_1A_2	137 A_1A_2	138	$A_1^2A_2A_1A_2$	139 A_2
141 A_2	144–146	$A_1^2A_2$	147 A_1A_2	148 $A_1^2A_2$	149 $A_1A_2^4$	150 $A_1^2A_2$	151 $A_1A_2^2$	152 $A_1^2A_2$	153 $A_1A_2^2$	154–57 A_2	162 A_1
163 A_1A_2	164 A_1	165 $A_1A_2^4$	166 A_1	167 $A_1A_2^3$	169 $A_1A_2^3$	170–73 A_2	176–82 A_2	183 $A_1A_2^6$	184 A_2	185 $A_1A_2^6$	186–89 A_2
193 A_1A_2	194	$A_1^2A_2A_1A_2$	195 A_1A_2	197 A_2	198	$A_1^2A_2A_1A_2$	199 A_2	200–202	A_1A_2	203 A_2	204 A_1A_2
205 A_2	208 $A_1^2A_2$	209 A_1A_2	210 $A_1^2A_2$	211 A_1A_2	212	$A_1^2A_2A_1^2A_2^3$	213 A_2	214 $A_1A_2^2$	215 $A_1A_2^4$	216–217	A_1A_2
218–21 A_2	225 $A_1A_2^3$	226–31 A_2	232 A_1A_2	233 $A_1A_2^2$	234–37 A_2	240–48 A_2	249 $A_1A_2^3$	250–53 A_2	321 $A_1A_2^4$	323 $A_1A_2^3$	324–27 A_2
328 A_1A_2	329 $A_1A_2^2$	330 A_1A_2	331 $A_1A_2^5$	332–33 A_2	337 $A_1A_2^3$	338 $A_1^2A_2^4$	339 $A_1A_2^2$	340–43 A_2	344 A_1A_2	345 $A_1A_2^2$	346–49 A_2
352 $A_1A_2^2$	353 $A_1A_2^3$	354–59 A_2	360 A_1A_2	361 $A_1A_2^2$	362–65 A_2	368–369	$A_1A_2^4$	370–75 A_2	376 $A_1A_2^2$	377 $A_1A_2^3$	378–81 A_2
386 A_1	387 A_1A_2	388 A_1	389 $A_1A_2^5$	390 A_1	391 $A_1A_2^3$	393 $A_1A_2^3$	394 $A_1A_2^2$	395–97 A_2	400–402	$A_1^2A_2^3$	403 $A_1A_2^2$
404 $A_1^2A_2^3$	405 $A_1A_2^5$	406 $A_1^2A_2^3$	407 $A_1A_2^3$	408 $A_1^2A_2^3$	409 $A_1A_2^3$	410–13 A_2	416–29 A_2	432–45 A_2	449 $A_1A_2^3$	450	$A_1^2A_2^2A_1A_2$
451 $A_1A_2^2$	452–55 A_2	456 A_1A_2	457–458	$A_1A_2^2$	459 $A_1A_2^3$	460–61 A_2	464 $A_1^2A_2^3$	465 $A_1A_2^2$	466 $A_1^2A_2^3$	467 $A_1A_2^2$	468–71 A_2
472–473	$A_1A_2^2$	474 $A_1A_2^4$	475–77 A_2	480 A_2	481 $A_1A_2^7$	482–88 A_2	489 $A_1A_2^3$	490–93 A_2	496–9 A_2	**$A_1 = 15$**	64–72 A_1
73 A_1A_2	74 A_1	75 A_1A_2	76 A_1	77 A_1A_2	78 A_1	80–82 A_1	83 A_1A_2	84–86 A_1	87 $A_1A_2^2$	88 A_1	89 A_1A_2
90 $A_1^2A_2$	91 A_2	92 A_1	93 A_1A_2	94 A_2	96–2 A_1	103 A_2	104 A_1	105 A_1A_2	106 A_1	107 A_1A_2	108 A_1
109 A_1A_2	110 A_1	112–14 A_1	115 A_2	116 A_1	117 $A_1A_2^4$	118 A_1	119 A_2	120 A_1	121 A_1A_2	122–23 A_2	124 A_1
125 $A_1A_2^2$	126 A_2	128–38 A_1	139 A_1A_2	140–42 A_1	144–46 A_1	147 $A_1^2A_2$	148–50 A_1	151 $A_1^2A_2$	152 A_1	153 $A_1^2A_2$	154 $A_1^2A_2^2$
155 A_2	156 A_1	157–58 A_2	160–70 A_1	171 A_2	172–74 A_1	176–78 A_1	179 $A_1^2A_2$	180–82 A_1	183 $A_1A_2^2$	184 A_1	185 $A_1A_2^2$
186–90 A_2	192–94 A_1	195 A_1A_2	196–98 A_1	199 A_1A_2	200 A_1	201 A_1A_2	202 $A_1^2A_2$	203 A_1A_2	204 A_1	205 A_2	206 $A_1A_2^2$
208 A_1	209 $A_1^2A_2$	210 A_1	211 A_1A_2	212 A_1	213 $A_1A_2^2$	214 A_1	215 $A_1A_2^2$	216 A_1	217 A_1A_2	218 $A_1^2A_2$	219 A_2
220 $A_1^2A_2^2$	221–22 A_2	224–26 A_1	227 A_1A_2	228 A_1	229 A_2	230 A_1	231 A_2	232 A_1	233 A_1A_2	234 $A_1^2A_2$	235 A_2
236 A_1	237–38 A_2	240 A_1	241 $A_1^2A_2$	242–47 A_2	248 A_1	249 A_1A_2	250–54 A_2	320–24 A_1	325 A_2	326 A_1	327 A_2
328 A_1	329 A_1A_2	330 A_1	331 A_1A_2	332 A_1	333–34 A_2	336–38 A_1	339 A_1A_2	340 A_1	341 A_2	342 A_1	343 A_2
344 A_1	345 A_1A_2	346 $A_1^2A_2^3$	347 A_2	348 A_1	349–50 A_2	352–54 A_1	355 A_2	356 A_1	357–59 A_2	360 A_1	361 A_1A_2
362 A_1	363 A_2	364 A_1	365–66 A_2	368 A_1	369 $A_1A_2^3$	370–71 A_2	372 A_1	373–75 A_2	376 A_1	377 $A_1A_2^2$	378–79 A_2
380 $A_1A_2^5$	381–82 A_2	384–94 A_1	395 $A_1A_2^2$	396 A_1	397 A_2	398 A_1	400–2 A_1	403 $A_1^2A_2$	404–6 A_1	407 $A_1A_2^2$	408 A_1
409 $A_1A_2^2$	410 $A_1^2A_2^2$	411–14 A_2	416–25 A_1	426–30 A_2	432–46 A_2	448–50 A_1	451 A_1A_2	452 A_1	453 A_2	454 A_1	455 A_2
456 A_1	457 A_1A_2	458 $A_1^2A_2$	459 $A_1A_2^2$	460–62 A_2	464 A_1	465 $A_1^2A_2$	466 A_1	467 A_1A_2	468 $A_1^2A_2^6$	469 A_2	470 $A_1^2A_2^2$
471 A_2	472 A_1	473 A_1A_2	474 $A_1^2A_2^2$	475 $A_1A_2^3$	476–78 A_2	480 A_1	481 $A_1A_2^4$	482–87 A_2	488 A_1	489 $A_1A_2^2$	490–94 A_2
496–10 A_2	**$A_1 = 19$**	76 $A_1^4A_2$	77–79 A_2	92 $A_1^2A_2$	93	$A_1A_2^2A_1A_2^3A_1A_2^3$		94 A_2	96 $A_1^4A_2^2$	97 $A_1^3A_2^2$	98 $A_1^4A_2^2$
99 A_2	100 $A_1^3A_2^2$	101–3 A_2	104 $A_1^4A_2$	105–106	$A_1^2A_2^2$	107 A_2	108 $A_1^4A_2$	109–11 A_2	112 $A_1^3A_2^2$	113 $A_1^2A_2^3$	114 A_2
116 $A_1^2A_2^2$	117–18 A_2	120 $A_1^2A_2^2$	121 $A_1A_2^2$	122 A_2	124	$A_1^2A_2^2A_1A_2^2$	125 $A_1A_2^2$	126 A_2	140 $A_1^4A_2$	141 A_2	142 $A_1^3A_2$
143 A_2	156–58 A_2	168 $A_1^4A_2$	169 $A_1^2A_2$	170–75 A_2	184 A_2	185	$A_1A_2^2A_1A_2^3A_1A_2^3$		186 A_2	188–90 A_2	204–7 A_2
220–22 A_2	224 $A_1^3A_2^2$	225 $A_1^2A_2^2$	226–27 A_2	228 $A_1A_2^2$	229–31 A_2	232 $A_1^4A_2$	233	$A_1^2A_2^2A_1A_2^2$	234–42 A_2	244–46 A_2	248 A_2
249 $A_1A_2^2$	250 A_2	252–54 A_2	332–35 A_2	348–50 A_2	352 $A_1^4A_2^2$	353 $A_1^3A_2^4$	354–59 A_2	360 $A_1^4A_2$	361 $A_1^2A_2^2$	362–67 A_2	368 $A_1^3A_2^4$
369 $A_1^2A_2^5$	370 A_2	372–74 A_2	376 $A_1^2A_2^2$	377 $A_1^2A_2^3$	378 A_2	380–82 A_2	396–99 A_2	412–14 A_2	424–31 A_2	440–42 A_2	444–46 A_2
460–63 A_2	476–78 A_2	480–98 A_2	500–2 A_2	504–6 A_2	508–10 A_2	**$A_1 = 20$**	75 A_2	78–79 A_2	90–91 A_2	99 A_2	102–3 A_2
106–7 A_2	110–11 A_2	114–15 A_2	122–23 A_2	139 A_2	141–43 A_2	152 A_1A_2	153 $A_1A_2^3$	154–55 A_2	169 $A_1A_2^5$	170–75 A_2	184–87 A_2
200–202	A_1A_2	203–7 A_2	216 A_1A_2	217 $A_1A_2^2$	218–19 A_2	225 $A_1A_2^3$	226–31 A_2	232 A_1A_2	233 $A_1A_2^3$	234–43 A_2	248 A_2
249 $A_1A_2^6$	250–51 A_2	330 $A_1A_2^3$	331 A_2	334–35 A_2	346–47 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366–67 A_2	370–71 A_2	378–79 A_2
393–394	$A_1A_2^5$	395–99 A_2	408 $A_1A_2^3$	409 $A_1A_2^4$	410–11 A_2	424–31 A_2	440–43 A_2	456 A_1A_2	457–458	$A_1A_2^3$	459 $A_1A_2^5$
460–63 A_2	472 $A_1A_2^2$	473 $A_1A_2^3$	474 $A_1A_2^6$	475 A_2	480–88 A_2	489 $A_1A_2^5$	490–99 A_2	504–7 A_2	**$A_1 = 21$**	74 A_1A_2	75 A_2
78–79 A_2	90–91 A_2	94 A_2	99 A_2	102–3 A_2	106–7 A_2	110–11 A_2	114–15 A_2	118 A_2	122–23 A_2	126 A_2	137 A_1A_2
138 $A_1A_2^2$	139 A_2	141–43 A_2	152 A_1A_2	153 $A_1A_2^2$	154–56 A_2	158 A_2	169	$A_1A_2A_1A_2^2$	170–75 A_2	184–88 A_2	190 A_2

200–202	A_1A_2	203 $A_1A_2^2$	204–7 A_2	216–217	A_1A_2	218–20 A_2	222 A_2	225 A_1A_2	226–31 A_2	232–233	A_1A_2
234–44 A_2	246 A_2	248 A_2	249 $A_1A_2^3$	250–52 A_2	254 A_2	330	$A_1A_2A_1A_2^2$	331 $A_1A_2^4$	334–35 A_2	346–47 A_2	350 A_2
354–55 A_2	358–59 A_2	362–63 A_2	366–67 A_2	370–71 A_2	374 A_2	378–79 A_2	382 A_2	393 $A_1A_2^3$	394 $A_1A_2^2$	395 $A_1A_2^8$	396–99 A_2
408–409	$A_1A_2^3$	410 $A_1A_2^8$	411–12 A_2	414 A_2	424–31 A_2	440–44 A_2	446 A_2	456 A_1A_2	457–458	$A_1A_2^2$	459 $A_1A_2^3$
460–63 A_2	472–473	$A_1A_2^2$	474 $A_1A_2^4$	475–76 A_2	478 A_2	480–88 A_2	489 $A_1A_2^4$	490–0 A_2	502 A_2	504–8 A_2	510 A_2
$A_1 = 22$	72–74	A_1A_2	75 A_2	76 A_1A_2	77–79 A_2	88–89	A_1A_2	90–91 A_2	92 A_1A_2	93	$A_1A_2A_1A_2^7$
96 A_1	97–98	$A_1A_2^2$	99 A_2	100 A_1	101–3 A_2	104 A_1A_2	105 $A_1A_2^2$	106 A_1A_2	107 A_2	108 A_1A_2	109–11 A_2
112 $A_1A_2^2$	113 $A_1A_2^3$	114–15 A_2	116 $A_1A_2^3$	117 A_2	120 A_1A_2	121 $A_1A_2^2$	122–23 A_2	124 A_1A_2	125 $A_1A_2^3$	136–138	A_1A_2
139 A_2	140 A_1A_2	141–43 A_2	152 A_1A_2	153 $A_1A_2^2$	154–55 A_2	156 A_1A_2	157 A_2	168 A_1A_2	169 $A_1A_2^2$	170–75 A_2	184 A_2
185 $A_1A_2^4$	186–89 A_2	200–202	A_1A_2	203 A_2	204 A_1A_2	205–7 A_2	216–218	A_1A_2	219 A_2	220 A_1A_2	221 A_2
224–226	$A_1A_2^2$	227–31 A_2	232 A_1A_2	233 $A_1A_2^2$	234–40 A_2	241 $A_1A_2^6$	242–45 A_2	248 A_1A_2	249 $A_1A_2^2$	250–53 A_2	328 A_1A_2
329 $A_1A_2^2$	330 A_1A_2	331 $A_1A_2^6$	332–35 A_2	344 A_1A_2	345 $A_1A_2^2$	346	$A_1A_2A_1A_2^7$	347–49 A_2	352 $A_1A_2^2$	353 $A_1A_2^3$	354–59 A_2
360 A_1A_2	361 $A_1A_2^2$	362–67 A_2	368 $A_1A_2^3$	369 $A_1A_2^4$	370–73 A_2	376 A_1A_2	377 $A_1A_2^2$	378–79 A_2	380	$A_1A_2A_1A_2^7$	381 A_2
392 A_1A_2	393 $A_1A_2^3$	394	$A_1A_2A_1A_2^3$	395–99 A_2	408 A_1A_2	409 $A_1A_2^3$	410 $A_1A_2^5$	411–13 A_2	424–31 A_2	440–45 A_2	456 A_1A_2
457 $A_1A_2^2$	458 A_1A_2	459 $A_1A_2^3$	460–63 A_2	472 A_1A_2	473 $A_1A_2^2$	474	$A_1A_2A_1A_2^3$	475–77 A_2	480 A_2	481 $A_1A_2^6$	482–88 A_2
489 $A_1A_2^3$	490–1 A_2	504 A_2	505 $A_1A_2^4$	506–9 A_2	**$A_1 = 23$**	72 $A_1^2A_2$	73–75	A_1A_2	76 $A_1^2A_2$	77–78	A_1A_2
79 A_2	88–90	A_1A_2	91 A_2	92–93	A_1A_2	94 A_2	96 $A_1^4A_2^2$	97 $A_1A_2^2$	98 $A_1^4A_2^2$	99 $A_1A_2^2$	100 $A_1^3A_2^2$
101 A_2	102 $A_1^2A_2^2$	103 A_2	104 $A_1^2A_2$	105–106	A_1A_2	107 A_2	108 $A_1^2A_2$	109 A_1A_2	110–11 A_2	112 $A_1^3A_2^2$	113 $A_1A_2^2$
114–15 A_2	116 $A_1^2A_2^2$	117 $A_1A_2^4$	118 A_2	120–121	A_1A_2	122–23 A_2	124 A_1A_2	125 $A_1A_2^2$	126 A_2	136 $A_1^3A_2$	
137–138	A_1A_2	139 $A_1A_2^2$	140 $A_1^3A_2$	141–142	A_1A_2	143 A_2	152–153	A_1A_2	154 $A_1A_2^2$	155 A_2	156 A_1A_2
157–58 A_2	168 $A_1^3A_2$	169 A_1A_2	170–71 A_2	172 $A_1^3A_2$	173–75 A_2	184 A_2	185 $A_1A_2^2$	186–90 A_2	200–204	A_1A_2	205 A_2
206 A_1A_2	207 A_2	216–218	A_1A_2	219 A_2	220 A_1A_2	221–22 A_2	224 $A_1^3A_2^2$	225 $A_1A_2^2$	226 $A_1^2A_2^2$	227 A_2	228 $A_1A_2^2$
229–31 A_2	232–234	A_1A_2	235–40 A_2	241 $A_1A_2^4$	242–46 A_2	248 A_1A_2	249 $A_1A_2^5$	250–54 A_2	328 $A_1^2A_2$	329–331	A_1A_2
332–35 A_2	344–346	A_1A_2	347–50 A_2	352 $A_1^3A_2^2$	353 $A_1A_2^2$	354–59 A_2	360 $A_1^2A_2$	361 A_1A_2	362–67 A_2	368 $A_1^2A_2^3$	369 $A_1A_2^3$
370–74 A_2	376 A_1A_2	377 $A_1A_2^2$	378–79 A_2	380	$A_1A_2^2A_1A_2^3A_1A_2^3$		381–82 A_2	392 $A_1^3A_2$	393–394	A_1A_2	395 $A_1A_2^3$
396–99 A_2	408 A_1A_2	409 $A_1A_2^4$	410 $A_1A_2^3$	411–14 A_2	424–31 A_2	440–46 A_2	456–458	A_1A_2	459	$A_1A_2A_1A_2^2$	460–63 A_2
472–474	A_1A_2	475 $A_1A_2^3$	476–78 A_2	480 A_2	481 $A_1A_2^4$	482–88 A_2	489 $A_1A_2^2$	490–2 A_2	504 A_2	505 $A_1A_2^3$	506–10 A_2
$A_1 = 27$	70–71 A_1	86–87 A_1	96–97 A_1	99–10 A_1	111 A_2	112–22 A_1	124–26 A_1	230–31 A_1	247 A_2	326–27 A_1	342–43 A_1
352–58 A_1	359 A_2	360–66 A_1	367 A_2	368–70 A_1	372–74 A_1	375 A_2	376–78 A_1	380–81 A_1	382 A_2	486–87 A_2	503 A_2
$A_1 = 28$	67 $A_1A_2^2$	71 A_2	74	$A_1^2A_2A_1A_2^2$	75 A_2	78–79 A_2	82 $A_1^2A_2$	83 $A_1A_2^2$	86 A_1A_2	87 A_2	90–91 A_2
99 A_2	102–3 A_2	106–7 A_2	110–11 A_2	114–15 A_2	118–19 A_2	122–23 A_2	130 $A_1^2A_2$	131 A_1A_2	134 $A_1^2A_2$	135 A_1A_2	
137	$A_1^2A_2^2A_1A_2$	138 A_1A_2	139 A_2	141–43 A_2	144 $A_1^2A_2$	145 A_1A_2	146 $A_1^2A_2$	147 A_1A_2	148 $A_1^2A_2^2$	149 $A_1A_2^3$	150 $A_1^2A_2$
151 $A_1A_2^2$	152–153	A_1A_2	154–55 A_2	162 $A_1^2A_2$	163 A_1A_2	164–165	$A_1A_2^2$	166 $A_1^2A_2$	167 $A_1A_2^2$	169 $A_1A_2^3$	170–78 A_2
179 $A_1A_2^5$	180–82 A_2	183 $A_1A_2^4$	184–87 A_2	193 A_1A_2	194 $A_1^2A_2$	195 A_1A_2	197 A_2	198 $A_1^2A_2$	199 A_2	200–202	A_1A_2
203–7 A_2	208 $A_1^2A_2$	209 A_1A_2	210	$A_1^2A_2A_1A_2$	211 A_1A_2	212 $A_1A_2^2$	213 A_2	214 $A_1A_2^2$	215 $A_1A_2^3$	216–217	A_1A_2
218–19 A_2	225	$A_1A_2A_1A_2^3$	226–31 A_2	232 A_1A_2	233	$A_1A_2A_1A_2^2$	234–48 A_2	249 $A_1A_2^5$	250–51 A_2	323 $A_1A_2^3$	326–27 A_2
330 $A_1A_2^3$	331 $A_1A_2^6$	334–35 A_2	338 A_1A_2	339 $A_1A_2^2$	342–43 A_2	346–47 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366–67 A_2	370–71 A_2
374–75 A_2	378–79 A_2	386 $A_1^2A_2$	387 A_1A_2	388 $A_1^2A_2^2$	389 $A_1A_2^5$	390 $A_1^2A_2$	391 $A_1A_2^3$	393 $A_1A_2^4$	394 A_1A_2	395–99 A_2	
400–401	$A_1^2A_2^3$	402 $A_1^2A_2$	403 A_1A_2	404 $A_1^2A_2^3$	405 $A_1A_2^5$	406 $A_1^2A_2^2$	407–409	$A_1A_2^3$	410 $A_1A_2^5$	411 A_2	416–43 A_2
449 $A_1A_2^3$	450 $A_1^2A_2$	451 $A_1A_2^2$	452–55 A_2	456 A_1A_2	457–458	$A_1A_2^2$	459 $A_1A_2^4$	460–63 A_2	464 $A_1^2A_2^3$	465 $A_1A_2^2$	466 $A_1^2A_2^2$
467	$A_1A_2A_1A_2^2$	468–69 A_2	470 $A_1^2A_2^6$	471 A_2	472 $A_1A_2^2$	473–474	$A_1A_2^3$	475 A_2	480–88 A_2	489 $A_1A_2^5$	490–7 A_2
$A_1 = 29$	66 $A_1^3A_2$	67 A_1A_2	70 $A_1^3A_2$	71 A_2	74 $A_1^2A_2$	75 A_1A_2	78 $A_1^2A_2$	79 A_2	82 $A_1^2A_2$	83 A_1A_2	86 $A_1^2A_2$
87 $A_1A_2^2$	90–91 A_2	94 A_2	98 $A_1^3A_2$	99 A_1A_2	102 $A_1^3A_2$	103 A_2	106 $A_1^2A_2$	107 A_2	110–11 A_2	114 $A_1^2A_2$	115 A_2
118–19 A_2	122–23 A_2	126 A_2	128 $A_1^5A_2$	129–130	$A_1^3A_2$	131 $A_1^2A_2$	132 $A_1^5A_2$	133–134	$A_1^3A_2$	135 $A_1^2A_2$	136 $A_1^5A_2$
137 A_1A_2	138 $A_1^2A_2$	139 A_1A_2	140 $A_1^3A_2^2$	141 A_2	142 $A_1^2A_2$	143 A_2	144 $A_1^4A_2$	145–146	$A_1^2A_2$	147 A_1A_2	148 $A_1^3A_2^2$
149 $A_1^2A_2^2$	150 $A_1^2A_2$	151 A_1A_2	152 $A_1^3A_2$	153 A_1A_2	154 $A_1A_2^2$	155 A_2	156 $A_1^2A_2^2$	158 A_2	160 $A_1^5A_2$	161–162	$A_1^3A_2$
163 $A_1^2A_2$	164 $A_1^3A_2^2$	165 $A_1^2A_2^2$	166 $A_1^3A_2$	167 $A_1^2A_2$	168 $A_1^5A_2$	169 A_1A_2	170 $A_1^2A_2$	171 A_2	172 $A_1^2A_2^2$	173–78 A_2	179 A_1A_2
180–81 A_2	182 $A_1^2A_2^2$	183 $A_1A_2^2$	184–88 A_2	190 A_2	192 $A_1^4A_2$	193 A_1A_2	194	$A_1^3A_2A_1^2A_2$	195 A_1A_2	196 $A_1^4A_2$	197 A_2
198	$A_1^3A_2A_1^2A_2$	199 A_1A_2	200 $A_1^3A_2$	201 A_1A_2	202 $A_1^2A_2$	203 A_1A_2	204 $A_1^2A_2^2$	205 A_2	206 $A_1A_2^2$	207 A_2	208 $A_1^3A_2$
209 A_1A_2	210 $A_1^2A_2$	211 A_1A_2	212 $A_1^2A_2^2$	213	$A_1A_2^2A_1A_2^3A_1A_2^3$		214 $A_1^2A_2^2$	215 $A_1A_2^2$	216 $A_1^2A_2$	217–218	A_1A_2
219–20 A_2	222 A_2	224 $A_1^4A_2$	225 A_1A_2	226	$A_1^3A_2A_1^2A_2$	227 A_1A_2	228 $A_1A_2^2$	229–31 A_2	232 $A_1^3A_2$	233 A_1A_2	234–48 A_2
249 A_1A_2	250–52 A_2	254 A_2	322 $A_1^3A_2$	323 A_1A_2	326–27 A_2	330 $A_1^2A_2$	331 $A_1A_2^2$	334–35 A_2	338 $A_1^2A_2$	339 A_1A_2	342–43 A_2
346	$A_1A_2^2A_1A_2^3A_1A_2^3$		347 A_2	350 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366–67 A_2	370–71 A_2	374–75 A_2	378–79 A_2
382 A_2	384 $A_1^5A_2$	385–386	$A_1^3A_2$	387 $A_1^2A_2$	388 $A_1^4A_2^2$	389 $A_1^3A_2^3$	390 $A_1^3A_2$	391 $A_1^2A_2$	392 $A_1^5A_2$	393 A_1A_2	394 $A_1^2A_2$
395 A_1A_2	396–99 A_2	400 $A_1^4A_2^3$	401	$A_1^2A_2A_1^2A_2^2$	402 $A_1^2A_2$	403 A_1A_2	404 $A_1^3A_2^3$	405 $A_1^2A_2^4$	406–407	$A_1^2A_2^2$	408 $A_1^3A_2^3$
409–410	$A_1A_2^2$	411–12 A_2	414 A_2	416–22 A_2	423 $A_1^2A_2^5$	424–44 A_2	446 A_2	448 $A_1^4A_2$	449 A_1A_2	450	$A_1^3A_2A_1^2A_2$
451 A_1A_2	452–55 A_2	456 $A_1^3A_2$	457 A_1A_2	458 $A_1^2A_2$	459 $A_1A_2^2$	460–63 A_2	464 $A_1^3A_2^2$	465 A_1A_2	466 $A_1^2A_2$	467 A_1A_2	468 $A_1^2A_2^6$
469 A_2	470 $A_1^2A_2^3$	471 A_2	472 $A_1^2A_2^2$	473–474	$A_1A_2^2$	475 $A_1A_2^3$	476 A_2	478 A_2	480–88 A_2	489 $A_1A_2^3$	490–8 A_2
510 A_2	**$A_1 = 30$**	64–74 A_1	75 $A_1A_2^2$	76–78 A_1	79 A_2	80–88 A_1	89–90	A_1A_2	91 A_2	92 A_1	93 A_1A_2
96–2 A_1	103 A_2	104–6 A_1	107 A_2	108–10 A_1	111 A_2	112–14 A_1	115 A_2	116–18 A_1	119 A_2	120 A_1	121 A_1A_2
122–23 A_2	124 A_1	125	$A_1A_2A_1A_2^3$	128–42 A_1	143 A_2	144–46 A_1	147 $A_1^2A_2$	148–50 A_1	151 $A_1^2A_2$	152 A_1	
153–154	A_1A_2	155 A_2	156 A_1	157 A_2	160–70 A_1	171 A_2	172–74 A_1	175 A_2	176–78 A_1	179 $A_1A_2^2$	180–81 A_1
182 $A_1^2A_2^2$	183 $A_1A_2^2$	184 A_1	185 $A_1A_2^2$	186–89 A_2	192–0 A_1	201 A_1A_2	202 A_1	203 A_1A_2	204 A_1	205 A_2	206 A_1
207 A_2	208–9 A_1	210 $A_1^2A_2$	211 A_1A_2	212–13 A_1	214 $A_1^2A_2$	215 $A_1A_2^2$	216–218	A_1A_2	219 A_2	220 A_1A_2	221 A_2
224–28 A_1	229 A_2	230 A_1	231 A_2	232 A_1	233–234	$A_1A_2^2$	235 A_2	236 A_1	237–39 A_2	240 A_1	241 $A_1A_2^4$
242–47 A_2	248 A_1A_2	249 $A_1A_2^2$	250–53 A_2	320–24 A_1	325 A_2	326 A_1	327 A_2	328–30 A_1	331	$A_1A_2^3A_1A_2^4$	332 A_1
333–35 A_2	336–40 A_1	341 A_2	342 A_1	343 A_2	344 A_1	345–346	A_1A_2	347 A_2	348 A_1	349 A_2	352–54 A_1
355 A_2	356 A_1	357–59 A_2	360–62 A_1	363 A_2	364 A_1	365–67 A_2	368–69 A_1	370–71 A_2	372 A_1	373–75 A_2	376 A_1
377 $A_1A_2^2$	378–79 A_2	380	$A_1A_2A_1A_2^5$	381 A_2	384–94 A_1	395 $A_1A_2^4$	396 A_1	397 A_2	398 A_1	399 A_2	400–2 A_1
403 $A_1^2A_2$	404–6 A_1	407 $A_1A_2^2$	408 A_1	409 A_1A_2	410 $A_1A_2^2$	411–13 A_2	416–25 A_1	426–45 A_2	448–52 A_1	453 A_2	454 A_1
455 A_2	456 A_1	457 A_1A_2	458 A_1	459 $A_1A_2^2$	460–63 A_2	464–65 A_1	466 $A_1^2A_2$	467 A_1A_2	468 A_1	469 A_2	470 $A_1^2A_2^3$
471 A_2	472–474	A_1A_2	475 $A_1A_2^3$	476–77 A_2	480 A_1	481 $A_1A_2^5$	482–87 A_2	488 A_1	489 $A_1A_2^3$	490–4 A_2	505 $A_1A_2^4$
506–9 A_2	**$A_1 = 31$**	64–90 A_1	91 A_1A_2	92–94 A_1	96–10 A_1	111 A_2	112–22 A_1	123 A_2	124–26 A_1	128–54 A_1	155 A_1A_2
156–58 A_1	160–86 A_1	187 A_2	188–89 A_1	190 A_2	192–2 A_1	203 A_1A_2	204–6 A_1	207 A_2	208–16 A_1	217 A_1A_2	218 A_1
219 A_1A_2	220 A_1	221 A_1A_2	222 $A_1^2A_2^2$	224–34 A_1	235 $A_1A_2^2$	236–38 A_1	239 A_2	240–46 A_1	247 A_2	248 A_1	249 A_1A_2
250–51 A_2	252 A_1	253–54 A_2	320–34 A_1	335 A_2	336–46 A_1	347 A_1A_2	348–50 A_1	352–58 A_1	359 A_2	360–66 A_1	367 A_2
368–74 A_1	375 A_2	376–78 A_1	379 A_2	380–81 A_1	382 A_2	384–10 A_1	411 $A_1A_2^2$	412–14 A_1	416–30 A_1	431 A_2	432–41 A_1
442–46 A_2	448–58 A_1	459 A_1A_2	460 A_1	461 A_2	462 A_1	463 A_2	464–70 A_1	471 $A_1^2A_2^3$	472 A_1	473 A_1A_2	474 A_1
475 A_1A_2	476 A_1	477–78 A_2	480–84 A_1	485–87 A_2	488–90 A_1	491–95 A_2	496–97 A_1	498–3 A_2	504 A_1	505 $A_1A_2^2$	506–10 A_2
$A_1 = 36$	67 $A_1A_2^2$	70–71 A_2	75 A_2	78–79 A_2	83 $A_1A_2^4$	86 $A_1A_2^5$	87 A_2	90–91 A_2	94–95 A_2	99 A_2	106–7 A_2
114–15 A_2	122–23 A_2	192–196	A_1A_2	197 A_2	198 A_1A_2	199 A_2	201–202	A_1A_2	203 A_2	204 A_1A_2	205–7 A_2
209 A_1A_2	211 $A_1A_2^2$	212 A_1A_2	213 A_2	214 A_1A_2	215 A_2	219–23 A_2	322 $A_1A_2^2$	323 $A_1A_2^3$	326–27 A_2	330 $A_1A_2^4$	331 $A_1A_2^7$
334–35 A_2	338–339	$A_1A_2^4$	342–43 A_2	346–47 A_2	350–51 A_2	354–55 A_2	362–63 A_2	370–71 A_2	378–79 A_2	448 A_1A_2	
449–451	$A_1A_2^2$	452–55 A_2	457–458	$A_1A_2^2$	459 $A_1A_2^4$	460–63 A_2	465 $A_1A_2^2$	467 $A_1A_2^3$	468–69 A_2	470 $A_1A_2^5$	471 A_2
475–79 A_2	**$A_1 = 37$**	66–67	A_1A_2	70 A_1A_2	71 A_2	74 A_1A_2	75 A_2	78–79 A_2	82–83	A_1A_2	
86	$A_1A_2A_1A_2^3$	87 $A_1A_2^5$	90–91 A_2	94–95 A_2	98–99	A_1A_2	102 A_2	106–7 A_2	110 A_2	114–15 A_2	118 A_2
122–23 A_2	126 A_2	136 A_1	137–138	$A_1A_2^2$	139 A_2	140 $A_1A_2^2$	141 A_2	142 $A_1A_2^2$	143 A_2	152 $A_1A_2^2$	153 $A_1A_2^3$
154–59 A_2	168 A_1	169 $A_1A_2^3$	170–72 A_2	174 A_2	184–88 A_2	190 A_2	192–196	A_1A_2	197 A_2	198–204	A_1A_2
205–7 A_2	208–212	A_1A_2	213	$A_1A_2A_1A_2^7$	214 A_1A_2	215	$A_1A_2A_1A_2^3$	216–217	A_1A_2	218–23 A_2	

224–227 A_1A_2	228 A_2	230 A_2	232–233 A_1A_2	234–36 A_2	238 A_2	240–44 A_2	246 A_2	248 A_2			
249 $A_1A_2A_1A_2^7$	250–52 A_2	254 A_2	322 A_1A_2	323 $A_1A_2^2$	326–27 A_2	330 $A_1A_2^2$	331 $A_1A_2^4$	334–35 A_2	338–339 $A_1A_2^3$		
342–43 A_2	346–47 A_2	350–51 A_2	354–55 A_2	358 A_2	362–63 A_2	366 A_2	370–71 A_2	374 A_2	378–79 A_2	382 A_2	392 $A_1A_2^2$
393 $A_1A_2^3$	394 $A_1A_2^2$	395 $A_1A_2^6$	396–99 A_2	408 $A_1A_2^3$	409 $A_1A_2^4$	410 $A_1A_2^6$	411–15 A_2	424–28 A_2	430 A_2	440–44 A_2	446 A_2
448–451 A_1A_2	452–55 A_2	456–459 $A_1A_2^2$	460–63 A_2	464–467 $A_1A_2^2$	468 $A_1A_2^6$	469 A_2	470 $A_1A_2^3$	471 A_2			
472–473 $A_1A_2^2$	474 $A_1A_2^3$	475 $A_1A_2^4$	476–80 A_2	481 $A_1A_2A_1A_2^7$	482–84 A_2	486 A_2	488 A_2	489 $A_1A_2^3$	490–92 A_2		
494 A_2	496–0 A_2	502 A_2	504–8 A_2	510 A_2	**$A_1 = 38$**	64 A_1A_2	65 A_2	66 A_1A_2	67 $A_1A_2^2$	68–71 A_2	
72–74 A_1A_2	75 A_2	76 A_1A_2	77–79 A_2	80–82 A_1A_2	83 $A_1A_2^3$	84 A_1A_2	85 A_2	86 A_1A_2	87 A_2		
88–89 A_1A_2	90–91 A_2	92 A_1A_2	93–95 A_2	96 A_1A_2	97 $A_1A_2^2$	98 $A_1A_2A_1A_2^2$	99–1 A_2	104 A_1A_2	105 $A_1A_2^2$		
106 A_1A_2	107 A_2	108 A_1A_2	109 A_2	112 A_1A_2	113 $A_1A_2^3$	114–15 A_2	116 A_1A_2	117 A_2	120 A_1A_2	121 $A_1A_2^2$	122–23 A_2
124 A_1A_2	125 $A_1A_2^5$	136 $A_1A_2A_1A_2A_1A_2^2$	137 $A_1A_2^2$	138 $A_1A_2A_1A_2^2$	139 A_2	140 $A_1A_2A_1A_2A_1A_2^2$					
141–43 A_2	152 $A_1A_2^2$	153 $A_1A_2^2A_1A_2^3$	154–59 A_2	168 $A_1A_2A_1A_2^2$	169 $A_1A_2^3$	170–73 A_2	184 A_2	185 $A_1A_2^5$	186–89 A_2		
192–196 A_1A_2	197 A_2	198 A_1A_2	199 A_2	200–202 A_1A_2	203 A_2	204 A_1A_2	205–7 A_2	208–212 A_1A_2			
213 A_2	214 A_1A_2	215 A_2	216–218 A_1A_2	219 A_2	220 A_1A_2	221–23 A_2	224–226 A_1A_2	227–29 A_2	232 A_1A_2		
233 $A_1A_2^2$	234–37 A_2	240–45 A_2	248 A_1A_2	249 $A_1A_2^3$	250–53 A_2	320 A_2	321 $A_1A_2^4$	322 $A_1A_2^2$	323 $A_1A_2^3$	324–27 A_2	328 A_1A_2
329 $A_1A_2^2$	330 A_1A_2	331 $A_1A_2^5$	332–35 A_2	336 A_1A_2	337 $A_1A_2^2$	338 $A_1A_2^3$	339 $A_1A_2^4$	340–43 A_2	344 A_1A_2	345 $A_1A_2^2$	346–51 A_2
352 $A_1A_2^2$	353 $A_1A_2^3$	354–57 A_2	360 A_1A_2	361 $A_1A_2^2$	362–65 A_2	368 $A_1A_2^3$	369 $A_1A_2^4$	370–73 A_2	376 A_1A_2	377 $A_1A_2^2$	378–81 A_2
392 $A_1A_2^2$	393–394 $A_1A_2^3$	395–99 A_2	408 $A_1A_2^2A_1A_2^3$	409 $A_1A_2^3$	410 $A_1A_2^5$	411–15 A_2	424–29 A_2	440–45 A_2	448 A_1A_2		
449–451 $A_1A_2^2$	452–55 A_2	456 A_1A_2	457–458 $A_1A_2^2$	459 $A_1A_2^3$	460–63 A_2	464 A_1A_2	465–467 $A_1A_2^2$	468–69 A_2			
470 $A_1A_2^5$	471 A_2	472 A_1A_2	473 $A_1A_2^2$	474 $A_1A_2^3$	475 $A_1A_2^4$	476–80 A_2	481 $A_1A_2^5$	482–85 A_2	488 A_2	489 $A_1A_2^3$	490–93 A_2
496–1 A_2	504 A_2	505 $A_1A_2^4$	506–9 A_2	**$A_1 = 39$**	64–65 $A_1^2A_2$	66–67 A_1A_2	68 $A_1^2A_2$	69 A_2	70 A_1A_2		
71 A_2	72 $A_1^2A_2$	73–75 A_1A_2	76 $A_1^2A_2$	77–78 A_1A_2	79 A_2	80–84 A_1A_2	85 A_2	86 A_1A_2			
87 $A_1A_2^3$	88–90 A_1A_2	91 A_2	92–93 A_1A_2	94–95 A_2	96–97 $A_1^2A_2$	98 A_1A_2	99 $A_1A_2A_1A_2^2$				
100 $A_1^2A_2$	101–2 A_2	104 $A_1^2A_2$	105–106 A_1A_2	107 A_2	108 $A_1^2A_2$	109 A_1A_2	110 A_2	112–113 A_1A_2	114–15 A_2		
116 A_1A_2	117 $A_1A_2^5$	118 A_2	120–121 A_1A_2	122–23 A_2	124 A_1A_2	125 $A_1A_2^2$	126 A_2	136 $A_1^2A_2A_1A_2^2$			
137 $A_1A_2A_1A_2^2$	138–139 $A_1A_2^2$	140 $A_1^2A_2A_1A_2^2$	141–142 $A_1A_2^2$	143 A_2	152–153 $A_1A_2^2$	154–55 A_2					
156 $A_1A_2^2$	157–59 A_2	168 $A_1^2A_2A_1A_2^2$	169 $A_1A_2^2$	170–74 A_2	184 A_2	185 $A_1A_2^4$	186–90 A_2	192–196 A_1A_2	197 A_2		
198–206 A_1A_2	207 A_2	208–218 A_1A_2	219 A_2	220 A_1A_2	221–23 A_2	224–227 A_1A_2	228–30 A_2				
232–234 A_1A_2	235–38 A_2	240 A_2	241 A_1A_2	242–46 A_2	248–249 A_1A_2	250–54 A_2	320 $A_1^2A_2$	321 $A_1^2A_2^2$	322 A_1A_2		
323 $A_1A_2^2$	324–27 A_2	328 $A_1^2A_2$	329–330 A_1A_2	331 $A_1A_2^2$	332–35 A_2	336–338 A_1A_2	339 $A_1A_2^2$	340–43 A_2			
344–345 A_1A_2	346 $A_1A_2^3$	347–51 A_2	352 $A_1^2A_2^2$	353 $A_1A_2^2$	354–58 A_2	360 $A_1^2A_2$	361 A_1A_2	362–66 A_2	368–369 $A_1A_2^3$		
370–74 A_2	376 A_1A_2	377 $A_1A_2^2$	378–79 A_2	380 $A_1A_2^5$	381–82 A_2	392–394 $A_1A_2^2$	395 $A_1A_2^4$	396–99 A_2	408 $A_1A_2^2A_1A_2^3$		
409 $A_1A_2^3$	410 $A_1A_2^4$	411–15 A_2	424–30 A_2	440–46 A_2	448–451 A_1A_2	452–55 A_2	456–458 A_1A_2	459 $A_1A_2^2$	460–63 A_2		
464–466 A_1A_2	467 $A_1A_2^2$	468 $A_1A_2^5$	469 A_2	470 $A_1A_2^3$	471 A_2	472 A_1A_2	473–474 $A_1A_2^2$	475 $A_1A_2^3$	476–80 A_2		
481 $A_1A_2^3$	482–86 A_2	488 A_2	489 $A_1A_2^2$	490–94 A_2	496–2 A_2	504 A_2	505 $A_1A_2^3$	506–10 A_2	**$A_1 = 45$**	66–67 A_1A_2	
70–71 A_1A_2	74–75 A_1A_2	78 $A_1A_2^2$	79 A_2	82–83 A_1A_2	86 $A_1A_2^2$	87 $A_1A_2^3$	90–91 A_2	94–95 A_2			
98–99 A_1A_2	102 A_1A_2	103 A_2	106 A_1A_2	107 A_2	110 A_2	114–15 A_2	118–19 A_2	122–23 A_2	126 A_2	128 A_1	
129–131 A_1A_2	132 A_1	133–135 A_1A_2	136 A_1	137–139 A_1A_2	140 $A_1A_2^2$	141 A_2	142 $A_1A_2^2$	143 A_2			
144 A_1	145–147 A_1A_2	148–150 $A_1A_2^2$	151 A_1A_2	152–153 $A_1A_2^2$	154–59 A_2	160 A_1	161–163 A_1A_2				
164 A_1	165–167 A_1A_2	168 A_1	169 A_1A_2	170–72 A_2	174 A_2	176–78 A_2	179 A_1A_2	180–82 A_2	183 A_1A_2	184–88 A_2	
190 A_2	192–203 A_1A_2	204 $A_1A_2^2$	205 A_2	206 A_1A_2	207 A_2	208–211 A_1A_2	212 $A_1A_2^2$	213–218 A_1A_2			
219–23 A_2	224–227 A_1A_2	228–29 A_2	230 A_1A_2	231 A_2	232–234 A_1A_2	235–36 A_2	238 A_2	240 A_2	241 A_1A_2		
242–48 A_2	249 A_1A_2	250–52 A_2	254 A_2	322–323 A_1A_2	326–27 A_2	330 $A_1A_2^2$	331 $A_1A_2^3$	334–35 A_2	338–339 $A_1A_2^2$		
342 $A_1A_2^6$	343 A_2	346 $A_1A_2^6$	347 A_2	350–51 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366 A_2	370–71 A_2	374–75 A_2	378–79 A_2
382 A_2	384 A_1	385–387 A_1A_2	388–389 $A_1A_2^2$	390–391 A_1A_2	392–394 $A_1A_2^2$	395 A_1A_2	396–99 A_2				
400 $A_1A_2^4$	401–402 $A_1A_2^2$	403 A_1A_2	404–405 $A_1A_2^3$	406–407 $A_1A_2^2$	408–409 $A_1A_2^3$	410 $A_1A_2^4$	411–18 A_2				
419 A_1A_2	420–22 A_2	423 A_1A_2	424–28 A_2	430 A_2	432–44 A_2	446 A_2	448–451 A_1A_2	452–53 A_2	454 A_1A_2	455 A_2	
456 $A_1A_2^2$	457–459 A_1A_2	460–63 A_2	464 $A_1A_2^2$	465–467 A_1A_2	468 $A_1A_2^4$	469 A_2	470 $A_1A_2^2$	471 $A_1A_2^3$			
472–474 $A_1A_2^2$	475 $A_1A_2^3$	476–80 A_2	481 A_1A_2	482–88 A_2	489 A_1A_2	490–92 A_2	494 A_2	496–8 A_2	510 A_2	**$A_1 = 46$**	
64 A_1	65 $A_1^2A_2$	66 $A_1^2A_2A_1A_2$	67 $A_1A_2^2$	68 A_1	69 A_2	70 $A_1^2A_2A_1A_2$	71 A_2	72–74 A_1A_2			
75 $A_1A_2^2$	76 A_1A_2	77–79 A_2	80–82 A_1A_2	83 $A_1A_2^2$	84 A_1A_2	85 A_2	86 A_1A_2	87 $A_1A_2^4$	88–89 A_1A_2		
90–91 A_2	92–93 A_1A_2	94–95 A_2	96 A_1	97 $A_1^2A_2$	98 $A_1A_2A_1A_2^2$	99 $A_1A_2^2$	100 A_1	101–3 A_2	104 A_1A_2		
105 $A_1A_2^2$	106 $A_1A_2A_1A_2A_1A_2A_1A_2A_1A_2^2$	107 A_2	108 A_1A_2	109 A_2	112–113 A_1A_2	114–15 A_2	116 A_1A_2	117–19 A_2			
120–121 A_1A_2	122–23 A_2	124 A_1A_2	125 $A_1A_2^3$	192–196 A_1A_2	197 A_2	198–199 A_1A_2	201–204 A_1A_2				
205 A_2	206 A_1A_2	207 A_2	209 A_1A_2	211–215 A_1A_2	219 A_2	220 A_1A_2	221–23 A_2	228–31 A_2	237 A_2	245 A_2	
247 A_2	320 A_1	321 $A_1^2A_2^3$	322 $A_1A_2^2$	323 $A_1A_2^2A_1A_2^3$	324–27 A_2	328 A_1A_2	329–330 A_1A_2	331 $A_1A_2^3A_1A_2^4$			
332–35 A_2	336 A_1A_2	337–338 $A_1A_2^2$	339 $A_1A_2^3$	340–43 A_2	344 A_1A_2	345 $A_1A_2^2$	346 $A_1A_2^4$	347–51 A_2	352 $A_1A_2^2$	353 $A_1A_2^3$	
354–59 A_2	360 A_1A_2	361 $A_1A_2^2$	362–65 A_2	368–369 $A_1A_2^3$	370–75 A_2	376 A_1A_2	377 $A_1A_2^2$	378–81 A_2	448–451 A_1A_2		
452–55 A_2	457–458 A_1A_2	459 $A_1A_2^2$	460–63 A_2	465 A_1A_2	467 $A_1A_2^2$	468 $A_1A_2^4$	469 A_2	470 $A_1A_2^3$	471 $A_1A_2^4$	475 $A_1A_2^3$	
476–79 A_2	484–87 A_2	493 A_2	501 A_2	503 A_2	**$A_1 = 47$**	64–66 A_1	67 A_1A_2	68–70 A_1	71 A_1A_2	72 A_1	73 A_1A_2
74 A_1	75 A_1A_2	76 A_1	77 A_1A_2	78 A_1	79 A_2	80 A_1	81 $A_1^2A_2$	82 A_1	83 A_1A_2	84 A_1	85 $A_1^2A_2$
86 A_1	87 A_1A_2	88 A_1	89–91 A_1A_2	92 A_1	93 A_1A_2	94–95 A_2	96–98 A_1	99 A_1A_2	100 A_1	101 $A_1^2A_2^2$	
102 A_1	103 A_2	104 A_1	105 A_1A_2	106 A_1	107 A_1A_2	108 A_1	109 A_1A_2	110 A_1	112 A_1	113 $A_1^2A_2$	114 A_1
115 A_1A_2	116 A_1	117 $A_1A_2^2$	118 A_1	119 A_2	120 A_1	121 A_1A_2	122–23 A_2	124 A_1	125 A_1A_2	126 A_2	128–30 A_1
131 A_1A_2	132–34 A_1	135 A_1A_2	136–38 A_1	139 A_1A_2	140–42 A_1	143 A_1A_2	144–46 A_1	147 A_1A_2	148–50 A_1	151 A_1A_2	152 A_1
153 A_1A_2	154 $A_1A_2^2$	155 A_2	156 A_1	157 $A_1A_2^2$	158–59 A_2	160–62 A_1	163 A_1A_2	164–66 A_1	167 A_1A_2	168–70 A_1	171 A_1A_2
172–74 A_1	176–78 A_1	179 A_1A_2	180–82 A_1	183 A_1A_2	184 A_1	185 $A_1A_2^2$	186–90 A_2	192 A_1	193–195 A_1A_2	196 A_1	
197–199 A_1A_2	200 A_1	201–203 A_1A_2	204 A_1	205–206 A_1A_2	207 A_2	208 A_1	209–211 A_1A_2				
212 A_1	213–221 A_1A_2	222 $A_1A_2^2$	223 A_2	224 A_1	225–227 A_1A_2	228 A_1	229 A_2	230 A_1A_2	231 A_2		
232 A_1	233–235 A_1A_2	236 A_1	237–38 A_2	240 A_1	241 A_1A_2	242 A_2	243 A_1A_2	244–47 A_2	248–249 A_1A_2		
250–54 A_2	320–22 A_1	323 A_1A_2	324 A_1	325 A_2	326 A_1	327 A_2	328 A_1	329 A_1A_2	330 A_1	331 $A_1A_2^2$	332 A_1
333–35 A_2	336 A_1	337 $A_1^2A_2$	338 A_1	339 A_1A_2	340 A_1	341 A_2	342 $A_1A_2^4$	343 A_2	344 A_1	345 A_1A_2	
346–347 $A_1A_2^2$	348 A_1	349–51 A_2	352 A_1	353 $A_1^2A_2^2$	354 A_1	355 $A_1A_2^2$	356 A_1	357–59 A_2	360 A_1	361 A_1A_2	
362 A_1	363 A_2	364 A_1	365–66 A_2	368 A_1	369 $A_1A_2^2$	370–71 A_2	372 A_1	373–75 A_2	376 A_1	377 A_1A_2	378–79 A_2
380 $A_1A_2^4$	381–82 A_2	384–86 A_1	387 A_1A_2	388–90 A_1	391 A_1A_2	392–94 A_1	395 A_1A_2	396 A_1	397 A_2	398 $A_1A_2^2$	399 A_2
400–2 A_1	403 A_1A_2	404 A_1	405 $A_1A_2^3$	406 A_1	407 $A_1A_2^2$	408 A_1	409–410 $A_1A_2^2$	411 $A_1A_2^3$	412–15 A_2	416–18 A_1	
419 A_1A_2	420–22 A_1	423 A_1A_2	424–25 A_1	426–30 A_2	432–46 A_2	448 A_1	449–451 A_1A_2	452 A_1	453 A_2	454 A_1A_2	
455 A_2	456 A_1	457–459 A_1A_2	460–63 A_2	464 A_1	465–467 A_1A_2	468 $A_1A_2^2$	469 A_2	470–471 $A_1A_2^2$			
472–473 A_1A_2	474–475 $A_1A_2^2$	476–79 A_2	480 A_1	481 $A_1A_2^2$	482–87 A_2	488 A_1	489 $A_1A_2^2$	490–94 A_2	496–4 A_2		
505 $A_1A_2^2$	506–10 A_2	**$A_1 = 53$**	66–67 A_1A_2	70 A_1A_2	71 A_2	74 A_1A_2	75 $A_1A_2^2$	78–79 A_2	82–83 A_1A_2		
86 A_1A_2	87 $A_1A_2^3$	90–91 A_2	94–95 A_2	98–99 A_1A_2	102–3 A_2	106 A_1A_2	107 A_2	110–11 A_2	114–15 A_2	118 A_2	
122–23 A_2	126 A_2	192–196 A_1A_2	197 A_2	198–199 A_1A_2	201–204 A_1A_2	205 A_2	206 A_1A_2	207 A_2			
209 A_1A_2	211–215 A_1A_2	219 A_2	220 A_1A_2	221–23 A_2	228–31 A_2	237–39 A_2	322 A_1A_2	323 $A_1A_2^2$	326–27 A_2	330 $A_1A_2^2$	
331 $A_1A_2^3$	334–35 A_2	338–339 $A_1A_2^2$	342–43 A_2	346 $A_1A_2^4$	347 A_2	350–51 A_2	354–55 A_2	358–59 A_2	362–63 A_2	366–67 A_2	
370–71 A_2	374 A_2	378–79 A_2	382 A_2	448–451 A_1A_2	452–55 A_2	457–458 A_1A_2	459 $A_1A_2^2$	460–63 A_2	465 A_1A_2		
467 $A_1A_2^2$	468 $A_1A_2^3$	469 A_2	470 $A_1A_2^3$	471 A_2	475 $A_1A_2^3$	476–79 A_2	484–87 A_2	493–95 A_2	**$A_1 = 55$**	64 $A_1^4A_2$	65 $A_1^2A_2$
66 $A_1^3A_2$	67 A_1A_2	68 $A_1^4A_2$	69 A_2	70 $A_1^3A_2$	71 A_2	72 $A_1^2A_2$	73–75 A_1A_2	76 $A_1^2A_2$	77–78 A_1A_2		
79 A_2	80 $A_1^2A_2$	81–83 A_1A_2	84 $A_1^2A_2$	85 A_2	86–94 A_1A_2	95 A_2	96 $A_1^4A_2$	97 $A_1^2A_2^2$	98 $A_1^3A_2$		
99 $A_1A_2^2$	100 $A_1^4A_2$	101 A_2	102 $A_1^2A_2^2$	103 A_2	104 $A_1^2A_2$	105–106 A_1A_2	107 $A_1A_2^2$	108 $A_1^2A_2$	109–110 A_1A_2		

111 A_2	112 $A_1^2A_2$	113–114	A_1A_2	115 A_2	116 $A_1^2A_2$	117	$A_1A_2^2A_1A_2^3A_1A_2^3$		118 A_2	120–122	A_1A_2
123 A_2	124–125	A_1A_2	126 A_2	136 $A_1^2A_2$	137–139	A_1A_2	140 $A_1^2A_2$	141–142	A_1A_2	143 A_2	
152–154	A_1A_2	155 A_2	156–157	A_1A_2	158–59 A_2	168 $A_1^2A_2$	169–170	A_1A_2	171 A_2	172 $A_1^2A_2$	173–75 A_2
184 A_1A_2	185 $A_1A_2^2$	186–90 A_2	192 $A_1^2A_2$	193–195	A_1A_2	196 $A_1^2A_2$	197 A_2	198–206	A_1A_2	207 A_2	
208–222	A_1A_2	223 A_2	224 $A_1^2A_2$	225–227	A_1A_2	228 $A_1^2A_2$	229–31 A_2	232–234	A_1A_2	235 $A_1A_2^2$	236 A_1A_2
237–39 A_2	240–241	A_1A_2	242–46 A_2	248–249	A_1A_2	250–54 A_2	320 $A_1^4A_2$	321 $A_1^2A_2^2$	322 $A_1^3A_2$	323 $A_1A_2^2$	324–27 A_2
328 $A_1^2A_2$	329–330	A_1A_2	331 $A_1A_2^2$	332–35 A_2	336 $A_1^2A_2$	337–338	A_1A_2	339 $A_1A_2^2$	340–43 A_2	344–346	A_1A_2
347 $A_1A_2^2$	348 A_1A_2	349–51 A_2	352 $A_1^3A_2^2$	353–354	$A_1^2A_2^2$	355 $A_1A_2^3$	356–59 A_2	360 $A_1^2A_2$	361 A_1A_2	362 $A_1A_2^2$	363–67 A_2
368 $A_1^2A_2^2$	369 $A_1^2A_2^3$	370–74 A_2	376–377	A_1A_2	378–79 A_2	380 A_1A_2	381–82 A_2	392 $A_1^2A_2$	393–394	A_1A_2	395 $A_1A_2^2$
396–99 A_2	408 A_1A_2	409–410	$A_1A_2^2$	411 $A_1A_2^3$	412–15 A_2	424 A_2	425	$A_1A_2^2A_1A_2^3A_1A_2^3$		426–31 A_2	440–46 A_2
448 $A_1^2A_2$	449–451	A_1A_2	452–55 A_2	456–458	A_1A_2	459 $A_1A_2^2$	460–63 A_2	464–468	A_1A_2	469 A_2	470 A_1A_2
471 A_2	472–474	A_1A_2	475 $A_1A_2^2$	476–80 A_2	481 $A_1A_2^2$	482–87 A_2	488 A_1A_2	489 $A_1A_2^2$	490–2 A_2	504 A_2	505 $A_1A_2^2$
506–10 A_2	**$A_1 = 63$**	64–90 A_1	91 A_1A_2	92–94 A_1	95 A_2	96–10 A_1	111 A_2	112–22 A_1	123 A_1A_2	124–26 A_1	192–99 A_1
201–2 A_1	203 A_1A_2	204–6 A_1	207 A_1A_2	209 A_1	211 A_1A_2	212–14 A_1	215 A_1A_2	219 A_1A_2	220 A_1	221–223	A_1A_2
228–31 A_1	237–38 A_1	239 A_2	245 A_1	247 A_2	320–34 A_1	335 A_2	336–46 A_1	347 A_1A_2	348–50 A_1	351 A_2	352–58 A_1
359 A_2	360–62 A_1	363 $A_1A_2^2$	364–66 A_1	367 A_2	368–74 A_1	375 A_2	376–78 A_1	379 A_2	380–81 A_1	382 A_2	448–55 A_1
457–58 A_1	459 A_1A_2	460 A_1	461 A_2	462 A_1	463 A_2	465 A_1	467 A_1A_2	468–70 A_1	471 A_1A_2	475 A_1A_2	476 A_1
477 A_2	478 $A_1A_2^2$	479 A_2	484 A_1	485–87 A_2	493–95 A_2	501 A_2	503 A_2	**$A_1 = 78$**	86 A_1	87 $A_1A_2^3$	96–97 A_1
99 A_2	100 A_1	101 A_2	102 A_1	103 A_2	104 A_1	105 A_1A_2	106 A_1	107 A_2	108 A_1	109 A_2	112–13 A_1
114–15 A_2	116 A_1	117–19 A_2	120 A_1	121 A_1A_2	122–23 A_2	124	$A_1^2A_2A_1A_2$	125 $A_1A_2^3$	162–63 A_1	166 A_1	167 A_1A_2
172 A_1	173–75 A_2	178 A_2	179 $A_1A_2^5$	180–82 A_2	183 $A_1A_2^3$	188–91 A_2	246–47 A_2	274–75 A_1	278 A_1	279 A_1A_2	284 A_1
285	$A_1A_2A_1A_2^2$	286–87 A_2	304–306	$A_1^2A_2$	307 $A_1A_2^3$	308 $A_1^2A_2$	309 A_1A_2	310 $A_1^2A_2$	311 $A_1A_2^2$	312 $A_1^2A_2$	313 A_1A_2
314–15 A_2	316 $A_1^2A_2$	317 A_1A_2	318 $A_1A_2^4$	319 A_2	368 $A_1^2A_2$	369 $A_1A_2^3$	370 A_2	372–75 A_2	376 $A_1^2A_2$	377 $A_1A_2^2$	378–79 A_2
380 $A_1A_2^4$	381 A_2	434–35 A_2	438–39 A_2	444–47 A_2	**$A_1 = 79$**	86–87 A_1	96–97 A_1	99–10 A_1	112–22 A_1	123 A_2	124–26 A_1
162–63 A_1	166–67 A_1	172–75 A_1	178–83 A_1	188–89 A_1	190–91 A_2	246 A_1	247 A_2	274–75 A_1	278–79 A_1	284–87 A_1	304–18 A_1
319 $A_1A_2^2$	368–70 A_1	372–74 A_1	375 A_2	376–78 A_1	379 A_2	380 A_1	381 $A_1A_2^2$	382 A_2	434–35 A_1	438–39 A_1	444–47 A_2
$A_1 = 84$	99 A_2	102–3 A_2	106–7 A_2	110–11 A_2	114–15 A_2	122–23 A_2	163 $A_1A_2^3$	165 $A_1A_2^3$	166 A_1A_2	167 $A_1A_2^3$	173–75 A_2
179 A_2	181–82 A_2	183 $A_1A_2^5$	189–91 A_2	231 A_2	271 A_2	287 A_2	291 $A_1A_2^4$	295 $A_1A_2^2$	299 A_2	303 $A_1A_2^5$	307 $A_1A_2^4$
311 $A_1A_2^3$	315 A_2	319 A_2	355 A_2	359 A_2	363 A_2	367 A_2	379 A_2	423 $A_1A_2^5$	431 A_2	439 A_2	447 A_2
$A_1 = 85$	99 A_1	102 A_1	103 A_2	106 A_1	107 A_2	110 A_1	111 A_2	114 A_1	115 A_2	118 A_1	122–23 A_2
126 A_2	162–67 A_1	172–74 A_1	175 A_2	178–82 A_1	183	$A_1A_2A_1A_2^3$	188–91 A_2	230 A_1	231 A_2	246 A_2	270 A_1
271 $A_1A_2^3$	286 A_1	287 A_2	290–91 A_1	294 A_1	295 A_1A_2	298 A_1	299 $A_1A_2^6$	302 A_1	303 $A_1A_2^2$	306–7 A_1	310 A_1
311 $A_1A_2^2$	314 $A_1A_2^7$	315 A_2	318 $A_1A_2^3$	319 A_2	354 A_1	355 A_2	358–59 A_2	362 A_1	363 A_2	366–67 A_2	370 A_2
374 A_2	378–79 A_2	382 A_2	418–22 A_1	423 $A_1A_2^3$	428–31 A_2	434–39 A_2	444–47 A_2	486–87 A_2	502 A_2	**$A_1 = 86$**	
88–89	A_1A_2	90–91 A_2	92 A_1A_2	93 $A_1A_2^3$	96 $A_1^4A_2$	97 A_1A_2	98 $A_1^4A_2$	99 A_2	100 $A_1^2A_2$	101–3 A_2	
104–106	A_1A_2	107 A_2	108 $A_1^2A_2$	109–11 A_2	112 $A_1^2A_2$	113 $A_1A_2^2$	114–15 A_2	116	$A_1^2A_2^2A_1^2A_2^2A_1^2A_2^2A_1A_2$		117 A_2
120–121	A_1A_2	122–23 A_2	124 A_1A_2	125 $A_1A_2^2$	136–138	A_1A_2	139 A_2	140 A_1A_2	141–43 A_2	152 A_1A_2	153 $A_1A_2^2$
154–55 A_2	156 A_1A_2	157–59 A_2	160 $A_1^4A_2$	161 $A_1^3A_2$	162 $A_1^4A_2$	163 A_1A_2	164 $A_1^5A_2$	165–167	A_1A_2	168 $A_1^3A_2$	169 A_1A_2
170–71 A_2	172 $A_1^2A_2$	173–82 A_2	183 $A_1A_2^5$	184 A_2	185 $A_1A_2^3$	186–91 A_2	200–202	A_1A_2	203 A_2	204 A_1A_2	205–7 A_2
216–218	A_1A_2	219 A_2	220 A_1A_2	221 A_2	224	$A_1^4A_2^2A_1A_2$	225–226	$A_1A_2^2$	227–31 A_2	232–233	A_1A_2
234–40 A_2	241 $A_1A_2^5$	242–45 A_2	248 A_1A_2	249 $A_1A_2^2$	250–53 A_2	264 $A_1^3A_2$	265	$A_1^2A_2A_1A_2$	266 $A_1^3A_2$	267 A_2	268 $A_1^3A_2$
269 $A_1A_2^2$	270 A_1A_2	271 $A_1A_2^5$	280–281	A_1A_2	282–83 A_2	284	$A_1^2A_2A_1A_2A_1A_2A_1A_2$		285	$A_1A_2A_1A_2^2A_1A_2^2$	
286–87 A_2	288–290	$A_1^2A_2$	291 $A_1A_2^2$	292 $A_1^2A_2$	293–294	A_1A_2	295 $A_1A_2^2$	296–298	$A_1^2A_2$	299 A_2	300 $A_1^2A_2$
301–302	A_1A_2	303 $A_1A_2^3$	304–306	$A_1^2A_2^2$	307 $A_1A_2^3$	308 $A_1^2A_2^2$	309 A_1A_2	310–311	$A_1A_2^2$	312 $A_1^2A_2$	313 A_1A_2
314 $A_1A_2^4$	315 A_2	316	$A_1^2A_2A_1^2A_2^2$	317 A_1A_2	318	$A_1A_2^2A_1A_2^3$	319 A_2	328–330	A_1A_2	331 $A_1A_2^5$	332–35 A_2
344–346	A_1A_2	347–49 A_2	352 $A_1^2A_2$	353 $A_1A_2^2$	354–59 A_2	360 $A_1^2A_2$	361 A_1A_2	362–67 A_2	368 $A_1^2A_2^2$	369 $A_1A_2^3$	370–71 A_2
372 $A_1^2A_2^7$	373 A_2	376 A_1A_2	377 $A_1A_2^2$	378–79 A_2	380 $A_1^2A_2^3$	381 A_2	392	$A_1^3A_2A_1A_2$	393–394	A_1A_2	395–99 A_2
408 A_1A_2	409 $A_1A_2^2$	410 $A_1A_2^5$	411–22 A_2	423 $A_1A_2^4$	424–47 A_2	456–458	A_1A_2	459 $A_1A_2^3$	460–63 A_2	472 A_1A_2	473 $A_1A_2^2$
474 A_1A_2	475–77 A_2	480 A_2	481 $A_1A_2^4$	482–88 A_2	489 $A_1A_2^2$	490–1 A_2	504 A_2	505 $A_1A_2^4$	506–9 A_2	**$A_1 = 87$**	
88	$A_1^7A_2A_1A_2$	89–90	A_1A_2	91 A_2	92 $A_1^3A_2$	93 A_1A_2	94 A_2	96 A_1	97 $A_1^5A_2$	98 A_1	99 $A_1^4A_2$
100 A_1	101 $A_1^2A_2$	102 A_1	103 A_2	104 $A_1^5A_2$	105 $A_1^2A_2$	106 $A_1^4A_2$	107 A_1A_2	108	$A_1^4A_2A_1^3A_2$	109–110	$A_1^2A_2$
111 A_2	112 A_1	113	$A_1^3A_2A_1^3A_2A_1^2A_2$		114 A_1	115 A_2	116 $A_1^7A_2^2$	117 $A_1^2A_2^2$	118 $A_1^3A_2^2$	120 $A_1^3A_2$	121 A_1A_2
122–23 A_2	124 $A_1^2A_2$	125 A_1A_2	126 A_2	136 A_1	137 $A_1^5A_2$	138 A_1	139 $A_1^2A_2$	140 A_1	141 $A_1^2A_2$	142 A_1	143 A_2
152 A_1	153 A_1A_2	154 $A_1A_2^2$	155 A_2	156 A_1	157	$A_1A_2A_1A_2A_1A_2^2$		158–59 A_2	160–64 A_1	165 $A_1^5A_2$	166 A_1
167 A_1A_2	168 $A_1^7A_2$	169 $A_1^3A_2$	170 $A_1^5A_2$	171 A_1A_2	172 $A_1^4A_2$	173 $A_1^2A_2$	174 $A_1^3A_2$	175 A_2	176–80 A_1	181	$A_1^3A_2A_1A_2$
182 A_1	183 A_1A_2	184 $A_1^4A_2$	185 A_1A_2	186–91 A_2	200 A_1	201–203	A_1A_2	204 $A_1^4A_2$	205–206	A_1A_2	207 A_2
216–218	A_1A_2	219 A_2	220 A_1A_2	221–22 A_2	224 A_1	225 $A_1^4A_2$	226 A_1	227 $A_1^2A_2$	228 A_1	229 A_2	230 $A_1^4A_2^2$
231 A_2	232 $A_1^4A_2$	233 A_1A_2	234 $A_1^2A_2$	235 A_2	236 $A_1^2A_2$	237–39 A_2	240 A_1	241 $A_1^2A_2^2$	242–46 A_2	248 $A_1^2A_2$	249 A_1A_2
250–54 A_2	264 A_1	265 $A_1^4A_2$	266 A_1	267 $A_1^3A_2$	268 $A_1^6A_2$	269 $A_1^2A_2$	270 $A_1^5A_2$	271 A_1A_2	280 A_1	281	$A_1^3A_2A_1A_2$
282 A_1	283 A_2	284 $A_1^4A_2$	285	$A_1^2A_2A_1A_2$	286 $A_1^2A_2^2$	287 A_2	288 A_1	289 $A_1^8A_2$	290 A_1	291 $A_1^7A_2$	292 A_1
293 $A_1^3A_2$	294 A_1	295 A_1A_2	296 $A_1^6A_2$	297 $A_1^3A_2$	298 $A_1^4A_2$	299 $A_1^2A_2$	300 $A_1^4A_2$	301 $A_1^2A_2$	302	$A_1^4A_2A_1^3A_2A_1^2A_2A_1^2A_2$	
303 A_1A_2	304 A_1	305 $A_1^6A_2$	306 A_1	307 $A_1^5A_2^2$	308 A_1	309	$A_1^3A_2A_1A_2$	310 A_1	311 A_1A_2	312 $A_1^4A_2$	313 $A_1^2A_2$
314 $A_1^2A_2^2$	315 A_2	316–317	$A_1^2A_2$	318 $A_1^2A_2^2$	319 $A_1A_2^2$	328 $A_1^6A_2$	329 A_1A_2	330 $A_1^5A_2$	331 A_1A_2	332	$A_1^4A_2A_1^3A_2$
333–35 A_2	344 $A_1^3A_2$	345–346	A_1A_2	347 A_2	348 $A_1^2A_2$	349–50 A_2	352 A_1	353 $A_1^2A_2$	354 $A_1^6A_2^2$	355–356	$A_1^2A_2^2$
357–59 A_2	360 $A_1^4A_2$	361–362	$A_1^2A_2$	363 A_2	364 $A_1^2A_2$	365–67 A_2	368 $A_1^6A_2^2$	369 $A_1^2A_2^2$	370–71 A_2	372 $A_1^2A_2^2$	373–74 A_2
376 $A_1^2A_2$	377 A_1A_2	378–79 A_2	380 $A_1^2A_2^2$	381 $A_1A_2^2$	382 A_2	392 A_1	393 $A_1^3A_2$	394 A_1	395 A_1A_2	396 $A_1^6A_2$	397 $A_1^2A_2$
398 $A_1^4A_2$	399 A_2	408 A_1	409 A_1A_2	410 $A_1A_2^3$	411–15 A_2	416 A_1	417 $A_1^7A_2$	418 A_1	419 $A_1^6A_2$	420 A_1	421 $A_1^3A_2$
422 A_1	423 A_1A_2	424 $A_1^5A_2$	425 $A_1^2A_2$	426–47 A_2	456 $A_1^5A_2$	457–459	A_1A_2	460–63 A_2	472–474	A_1A_2	475 $A_1A_2^2$
476–78 A_2	480 $A_1^6A_2^2$	481 $A_1^2A_2^2$	482–87 A_2	488 $A_1^2A_2$	489 A_1A_2	490–2 A_2	504 A_2	505 $A_1A_2^2$	506–10 A_2	**$A_1 = 94$**	96–97 A_1
99–2 A_1	103 A_2	104–6 A_1	107 A_2	108–10 A_1	111 A_2	112–18 A_1	119 A_2	120 A_1	121 A_1A_2	122–23 A_2	124 A_1
125 A_1A_2	162–67 A_1	172–74 A_1	175 A_2	178 A_1	179 A_1A_2	180–82 A_1	183 A_1A_2	188–91 A_2	230 A_1	231 A_2	246–47 A_2
258–63 A_1	268–71 A_1	274–79 A_1	284–86 A_1	287 A_2	288–2 A_1	303 $A_1A_2^2$	304–10 A_1	311 A_1A_2	312–14 A_1	315 A_2	316 A_1
317 $A_1^2A_2$	318 A_1A_2	319 $A_1A_2^2$	326 A_1	327 A_2	342 A_1	343 A_2	352–56 A_1	357–59 A_2	360–62 A_1	363 A_2	364 A_1
365–67 A_2	368–70 A_1	372 A_1	373–75 A_2	376 A_1	377 A_1A_2	378–79 A_2	380 A_1	381 A_2	418–22 A_1	423 $A_1A_2^2$	428–31 A_2
434–38 A_2	439 $A_1A_2^3$	444–47 A_2	486–87 A_2	502–3 A_2	**$A_1 = 95$**	96–97 A_1	99–26 A_1	162–67 A_1	172–75 A_1	178–83 A_1	188–90 A_1
191 A_2	230–31 A_1	246 A_1	247 $A_1^2A_2^2$	258–63 A_1	268–71 A_1	274–79 A_1	284–18 A_1	319 A_1A_2	326–27 A_1	342–43 A_1	352–66 A_1
367 A_2	368–70 A_1	372–74 A_1	375 A_2	376–78 A_1	379 A_2	380–82 A_1	418–23 A_1	428–31 A_1	434–39 A_1	444 A_1	445–47 A_2
486 A_1	487 A_2	502–3 A_2	**$A_1 = 98$**	105 A_1A_2	108	$A_1^2A_2A_1A_2$	109 A_2	113 $A_1A_2^4$	116 $A_1A_2^4$	117 A_2	121 $A_1A_2^2$
124 $A_1A_2^2$	125 $A_1A_2^4$	139 A_2	141–43 A_2	147 $A_1^2A_2^4$	149 $A_1^2A_2^5$	150	$A_1^2A_2A_1A_2^2$	151 $A_1^2A_2^3$	153 $A_1A_2^3$	155 A_2	157–59 A_2
169 A_1A_2	173–75 A_2	179 A_2	181–83 A_2	185 A_2	189–91 A_2	209 A_1A_2	211 $A_1A_2^3$	213 A_2	214 $A_1A_2^2$	215 A_2	217 $A_1A_2^2$
219 A_2	221–23 A_2	241 A_2	249 $A_1A_2^4$	253 A_2	275 $A_1^2A_2^4$	277 $A_1A_2^3$	279 $A_1A_2^2$	285	$A_1A_2^2A_1A_2^3A_1A_2^3$		287 A_2
307 $A_1A_2^5$	309 $A_1A_2^2$	311 $A_1A_2^3$	315 A_2	317 $A_1A_2^2$	319 A_2	347 A_2	349 A_2	381 A_2	415 A_2	447 A_2	**$A_1 = 99$**
100 A_1	101 A_2	102 A_1	104 A_1	105	$A_1^2A_2A_1A_2$	106 A_1	108 $A_1^2A_2$	109 A_1A_2	110 $A_1A_2^2$	112–14 A_1	116 A_1
117 $A_1A_2^4$	118 A_2	120 A_1	121 A_1A_2	122 A_2	124	$A_1^2A_2A_1^2A_2^2$	125 $A_1A_2^2$	126 A_2	128–34 A_1	135 $A_1^2A_2$	136–38 A_1
139 A_2	140 A_1	141 A_1A_2	142 A_1	143 A_2	144–50 A_1	151 $A_1^2A_2$	152 A_1	153 $A_1A_2^2$	154–55 A_2	156 A_1	157–59 A_2
160–64 A_1	165 A_1A_2	166 A_1	167	$A_1^2A_2A_1A_2$	168 A_1	169 A_1A_2	170 A_1	171 A_2	172 A_1	173 A_1A_2	174–82 A_2
183 $A_1^2A_2^3$	184–91 A_2	192–96 A_1	197 A_2	198 A_1	199 A_2	200 A_1	201 $A_1^2A_2$	202 A_1	203 A_2	204 A_1	205–7 A_2
208–10 A_1	211 A_1A_2	212 A_1	213 A_2	214 A_1A_2	215 $A_1A_2^2$	216 A_1	217 A_1A_2	218–23 A_2	224–26 A_1	228 A_1	229–30 A_2
232 A_1	233	$A_1^2A_2A_1A_2$	234 A_2	236–38 A_2	240–42 A_2	244–46 A_2	248 A_2	249 $A_1A_2^2$	250 A_2	252–54 A_2	258–62 A_1

263 A_1A_2	264–66 A_1	267 A_2	268 A_1	269 A_1A_2	270 A_1	271 $A_1A_2^2$	274–76 A_1	277 A_1A_2	278 A_1	279 A_1A_2	280 A_1
281 A_1A_2	282–83 A_2	284 A_1	285 A_1A_2	286–87 A_2	288–92 A_1	293 A_1A_2	294 A_1	295 A_1A_2	296 A_1	297 A_1A_2	298 A_1
299 $A_1A_2^4$	300 $A_1^2A_2$	301 A_1A_2	302 $A_1^2A_2A_1^2A_2^2$		303 $A_1A_2^2$	304–6 A_1	307 $A_1^2A_2^3$	308 A_1	309 A_1A_2	310 $A_1^2A_2^2$	311 $A_1A_2^2$
312 A_1	313 A_1A_2	314 $A_1^2A_2^6$	315 A_2	316 $A_1^2A_2$	317 A_1A_2	318 $A_1^2A_2^4$	319 A_2	320–23 A_1	324–27 A_2	328 A_1	329 $A_1^2A_2$
330 A_1	331 $A_1A_2^4$	332–35 A_2	336–38 A_1	339 $A_1A_2^2$	340–43 A_2	344 A_1	345 A_1A_2	346–51 A_2	352 A_1	353 $A_1^2A_2^2$	354 A_1
356–58 A_2	360 A_1	361 $A_1^2A_2$	362 A_2	364–66 A_2	368 A_1	369 $A_1^2A_2^3$	370 A_2	372 $A_1^2A_2^6$	373–74 A_2	376 $A_1^2A_2^2$	377 $A_1A_2^2$
378 A_2	380 $A_1^2A_2^4$	381–82 A_2	384–88 A_1	389 $A_1A_2^2$	390 A_1	391 A_1A_2	392–94 A_1	395 A_2	396 A_1	397–99 A_2	400–2 A_1
403 A_1A_2	404 A_1	405 $A_1A_2^2$	406 A_1	407 A_1A_2	408 A_1	409 $A_1A_2^2$	410 $A_1A_2^6$	411–22 A_2	423 $A_1A_2^2$	424–47 A_2	448–50 A_1
451 A_1A_2	452–55 A_2	456 A_1	457 $A_1^2A_2$	458 A_1A_2	459 $A_1A_2^2$	460–63 A_2	464 A_1	465 A_1A_2	466–467 $A_1A_2^2$		468 $A_1A_2^6$
469 A_2	470 $A_1A_2^3$	471 A_2	472 A_1	473 A_1A_2	474 $A_1A_2^3$	475–82 A_2	484–86 A_2	488 A_2	489 $A_1^2A_2^3$	490 A_2	492–94 A_2
496–98 A_2	500–2 A_2	504–6 A_2	508–10 A_2	**$\mathbf{A_1 = 102}$**	104–106 A_1A_2		107 A_2	108 $A_1^2A_2A_1A_2A_1A_2A_1A_2A_1A_2$			109 A_2
112 A_1	113 A_1A_2	114–15 A_2	116 A_1	117 A_2	120–121 A_1A_2		122–23 A_2	124 A_1A_2	125 $A_1A_2^3$	128–30 A_1	131 $A_1^2A_2$
132–34 A_1	135 $A_1^2A_2$	136–38 A_1	139 A_2	140 A_1	141 A_2	142 A_1	143 A_2	144–46 A_1	147 $A_1^2A_2^2$	148–50 A_1	151 $A_1^2A_2^2$
152 $A_1A_2^2$	153 $A_1A_2^2A_1A_2^3$		154–59 A_2	160–62 A_1	163 $A_1^2A_2$	164–66 A_1	167 $A_1A_2^2$	168 A_1	169 $A_1A_2^2$	170–71 A_2	172 A_1
173–84 A_2	185 $A_1A_2^4$	186–91 A_2	192–194 A_1A_2		195 $A_1^2A_2$	196 A_1A_2	197 A_2	198 $A_1^2A_2A_1A_2A_1A_2A_1A_2A_1A_2$			199 A_2
200–202 A_1A_2		203 A_2	204 A_1A_2	205–7 A_2	208–212 A_1A_2		213 A_2	214 A_1A_2	215 $A_1A_2^4$	216–218 A_1A_2	
219 A_2	220 A_1A_2	221–23 A_2	224–226 A_1A_2		227–29 A_2	232–234 A_1A_2		235–37 A_2	240 A_2	241 $A_1A_2A_1A_2^7$	
242–45 A_2	248 A_1A_2	249 $A_1A_2^3$	250–53 A_2	258–60 A_1	261 $A_1A_2^3$	262 A_1	263 A_1A_2	264–66 A_1	267 A_2	268 A_1	269 $A_1A_2^2$
270 A_1	271 A_2	274 A_1	275 $A_1^2A_2^2$	276 A_1	277 $A_1A_2^2$	278 A_1	279 A_1A_2	280 A_1	281 $A_1A_2^2$	282–83 A_2	284 A_1
285 $A_1A_2^2$	286–87 A_2	288–92 A_1	293 A_1A_2	294 A_1	295 $A_1A_2^2$	296 $A_1^2A_2$	297 A_1A_2	298 $A_1^2A_2$	299 A_2	300 $A_1^2A_2$	301 A_1A_2
302 $A_1A_2^2$	303 $A_1A_2^4$	304 A_1	305–306 $A_1^2A_2^2$		307 $A_1A_2^2$	308 $A_1^2A_2^2$	309 A_1A_2	310 $A_1^2A_2^2$	311 $A_1A_2^3$	312 $A_1^2A_2^2$	313 A_1A_2
314–15 A_2	316 $A_1^2A_2^2$	317 $A_1A_2A_1A_2^2$		318–19 A_2	320 A_1	321 $A_1^2A_2^2$	322 A_1	323 $A_1A_2^2$	324–27 A_2	328–330 A_1A_2	
331 $A_1A_2^4$	332–35 A_2	336 A_1	337–338 A_1A_2		339 $A_1A_2^3$	340–43 A_2	344–345 A_1A_2		346 $A_1A_2A_1A_2^7$		347–51 A_2
352 $A_1^2A_2$	353 $A_1A_2^2$	354–57 A_2	360 $A_1^2A_2$	361 A_1A_2	362–65 A_2	368 $A_1^2A_2^2$	369 $A_1A_2^3$	370–73 A_2	376 A_1A_2	377 $A_1A_2^2$	378–79 A_2
380 $A_1A_2^4$	381 A_2	384–86 A_1	387 A_1A_2	388 A_1	389 $A_1A_2^2$	390–391 A_1A_2		392 A_1	393–394 $A_1A_2^2$		395–99 A_2
400 A_1	401 $A_1A_2^2$	402 $A_1A_2^3$	403 A_1A_2	404 $A_1A_2^3$	405–406 $A_1A_2^2$		407 $A_1A_2A_1A_2^2$		408 $A_1A_2^2A_1A_2^3$		409 $A_1A_2^3$
410 $A_1A_2^4$	411–22 A_2	423 $A_1A_2^4$	424–47 A_2	448–451 A_1A_2		452–55 A_2	456–458 A_1A_2		459 $A_1A_2^2$	460–63 A_2	
464–466 A_1A_2		467 $A_1A_2^2$	468 $A_1A_2^4$	469 A_2	470 $A_1A_2^3$	471 A_2	472 A_1A_2	473 $A_1A_2^2$	474 $A_1A_2^3$	475 $A_1A_2^4$	476–80 A_2
481 $A_1A_2^4$	482–85 A_2	488 A_2	489 $A_1A_2^2$	490–93 A_2	496–1 A_2	504 A_2	505 $A_1A_2^4$	506–9 A_2	**$\mathbf{A_1 = 103}$**	104–6 A_1	107 A_1A_2
108 A_1	109 A_1A_2	110 A_1	112–18 A_1	120 A_1	121 A_1A_2	122 A_1	123 A_2	124 A_1	125 A_1A_2	126 A_2	128–54 A_1
155 A_2	156–58 A_1	159 A_2	160–74 A_1	175 A_2	176–85 A_1	186–87 A_2	188 A_1	189–91 A_2	192–98 A_1	199 A_1A_2	200 A_1
201 A_1A_2	202 A_1	203 A_1A_2	204 A_1	205 A_1A_2	206 A_1	207 A_2	208–14 A_1	215 A_1A_2	216 A_1	217 A_1A_2	218 A_1
219 A_2	220 A_1	221–23 A_2	224–30 A_1	232 A_1	233 A_1A_2	234 A_1	235 A_2	236 A_1	237–38 A_2	240–42 A_1	243 A_2
244 A_1	245–46 A_2	248 A_1	249 A_1A_2	250–54 A_2	258–71 A_1	274–82 A_1	283 A_2	284–86 A_1	287 A_2	288–2 A_1	303 $A_1^2A_2$
304–14 A_1	315 A_2	316 A_1	317 $A_1^2A_2$	318 A_1	319 A_2	320–24 A_1	325 A_2	326 A_1	327 A_2	328–30 A_1	331 A_1A_2
332 A_1	333 A_2	334 A_1	335 A_2	336–40 A_1	341 A_2	342 A_1	343 A_2	344 A_1	345 A_1A_2	346 A_1	347 A_2
348 A_1	349–51 A_2	352–56 A_1	357 A_2	358 A_1	360 A_1	361 $A_1^2A_2$	362 A_1	363 A_2	364 A_1	365–66 A_2	368–70 A_1
371 A_2	372 A_1	373–74 A_2	376 A_1	377 A_1A_2	378–79 A_2	380 $A_1^2A_2^2$	381 $A_1A_2^2$	382 A_2	384–98 A_1	399 A_2	400–10 A_1
411 A_2	412 A_1	413–15 A_2	416–26 A_1	427 A_2	428 A_1	429–47 A_2	448–50 A_1	451 A_1A_2	452 A_1	453 A_2	454 A_1
455 A_2	456 A_1	457 A_1A_2	458 A_1	459 A_1A_2	460 A_1	461–63 A_2	464–66 A_1	467 A_1A_2	468 A_1	469 A_2	
470–471 $A_1A_2^2$		472 A_1	473 A_1A_2	474–475 $A_1A_2^2$		476–79 A_2	480–82 A_1	483–86 A_2	488 A_1	489 A_1A_2	490–94 A_2
496–2 A_2	504 A_2	505 $A_1A_2^2$	506–10 A_2	**$\mathbf{A_1 = 105}$**	106 A_2	110 A_2	114–15 A_2	118–19 A_2	122 A_2	126 A_2	
130–131 A_1A_2		132 $A_1^2A_2^2A_1A_2$		133 $A_1A_2A_1A_2^2$		134–135 A_1A_2		138 A_1A_2	139 A_2	140 $A_1^2A_2^2A_1A_2$	
141 $A_1A_2^2$	142–143 A_1A_2		146–147 A_1A_2		148–149 $A_1A_2^2$		150–151 A_1A_2		154–59 A_2	162–163 A_1A_2	
164 $A_1^2A_2^2A_1A_2$		165 $A_1A_2^2$	166–167 A_1A_2		170–75 A_2	178 A_2	179 $A_1A_2^3$	180–82 A_2	183 $A_1A_2^2$	186–91 A_2	
194–195 A_1A_2		196–197 $A_1A_2^2$		198–199 A_1A_2		202–203 A_1A_2		204 $A_1A_2^2$	205 A_2	206 A_1A_2	207 A_2
210–211 A_1A_2		212 $A_1A_2^2$	213 $A_1A_2^4$	214 A_1A_2	215 $A_1A_2^2$	218–23 A_2	226–227 A_1A_2		228–29 A_2	230 A_1A_2	231 A_2
234 A_2	236 A_2	238 A_2	242–47 A_2	250 A_2	252 A_2	254 A_2	258–259 A_1A_2		262–263 A_1A_2		266 A_1A_2
267 A_2	270–271 A_1A_2		274–275 A_1A_2		278–279 A_1A_2		282–83 A_2	286–87 A_2	290–291 A_1A_2		
294–295 A_1A_2		298 A_1A_2	299 $A_1A_2^5$	302 A_1A_2	303 $A_1A_2^2$	306–307 $A_1A_2^3$		310 A_1A_2	311 $A_1A_2^2$	314–15 A_2	318 $A_1A_2^5$
319 A_2	322–323 A_1A_2		326 A_1A_2	327 A_2	330 A_1A_2	331 $A_1A_2^3$	334–35 A_2	338 A_1A_2	339 $A_1A_2^2$	342 $A_1A_2^3$	343 A_2
346–47 A_2	350–51 A_2	354–55 A_2	358–59 A_2	362 A_2	366 A_2	370–71 A_2	374–75 A_2	378 A_2	382 A_2	386–387 A_1A_2	
388–389 $A_1A_2^2$		390–391 A_1A_2		394–395 A_1A_2		396 $A_1A_2^2$	397 A_2	398 A_1A_2	399 A_2	402–403 A_1A_2	
404 $A_1A_2^2A_1A_2^3$		405 $A_1A_2^3$	406 A_1A_2	407 $A_1A_2^2$	410 $A_1A_2^5$	411–15 A_2	418 A_2	419 A_1A_2	420 A_2	421 $A_1A_2^4$	
422–423 A_1A_2		426–31 A_2	434–38 A_2	439 $A_1A_2^3$	442–47 A_2	450–451 A_1A_2		452–53 A_2	454 A_1A_2	455 A_2	
458–459 A_1A_2		460–63 A_2	466 A_1A_2	467 $A_1A_2^2$	468 $A_1A_2^4$	469 A_2	470 $A_1A_2^2$	471 $A_1A_2^3$	474 $A_1A_2^3$	475–79 A_2	482–87 A_2
490 A_2	492 A_2	494 A_2	498–3 A_2	506 A_2	508 A_2	510 A_2	**$\mathbf{A_1 = 107}$**	108–10 A_1	112–18 A_1	119 A_2	120–22 A_1
124 A_1	125 $A_1^2A_2$	126 A_2	128–34 A_1	135 A_1A_2	136–42 A_1	143 A_1A_2	144–50 A_1	151 A_1A_2	152–54 A_1	155 A_2	156–58 A_1
159 A_2	160–66 A_1	167 A_1A_2	168–74 A_1	175 A_2	176–82 A_1	183 A_1A_2	184–85 A_1	186–87 A_2	188 A_1	189–91 A_2	192–98 A_1
199 A_1A_2	200–2 A_1	203 A_1A_2	204–6 A_1	207 A_2	208–10 A_1	211 A_1A_2	212–14 A_1	215 A_1A_2	216–18 A_1	219 A_2	220 A_1
221–23 A_2	224–30 A_1	231 A_2	232–34 A_1	236 A_1	237–38 A_2	240–42 A_1	243 A_2	244 A_1	245–47 A_2	248–49 A_1	250 A_2
252–54 A_2	258–70 A_1	271 A_1A_2	274–78 A_1	279 A_1A_2	280–82 A_1	283 A_2	284–86 A_1	287 A_2	288–94 A_1	295 A_1A_2	296–2 A_1
303 A_1A_2	304–10 A_1	311 A_1A_2	312–14 A_1	315 A_2	316 A_1	317 $A_1^2A_2$	318 $A_1^2A_2^2$	319 $A_1A_2^2$	320–24 A_1	325 A_2	326 A_1
327 A_2	328–32 A_1	333 A_2	334 A_1	335 A_2	336–40 A_1	341 A_2	342 A_1	343 A_2	344–46 A_1	347 A_2	348 A_1
349–51 A_2	352–56 A_1	357 A_2	358 A_1	359 A_2	360–62 A_1	364 A_1	365–66 A_2	368–70 A_1	371 A_2	372 A_1	373–75 A_2
376–77 A_1	378 A_2	380 A_1	381–82 A_2	384–90 A_1	391 A_1A_2	392–98 A_1	399 A_2	400–6 A_1	407 A_1A_2	408–10 A_1	411 A_2
412 A_1	413–15 A_2	416–22 A_1	423 A_1A_2	424–26 A_1	427 A_2	428 A_1	429–38 A_2	439 $A_1A_2^2$	440–47 A_2	448–52 A_1	453 A_2
454 A_1	455 A_2	456–58 A_1	459 A_1A_2	460 A_1	461–63 A_2	464–66 A_1	467 A_1A_2	468 A_1	469 A_2	470–471 $A_1A_2^2$	
472–73 A_1	474–475 $A_1A_2^2$		476–79 A_2	480–82 A_1	483–87 A_2	488–89 A_1	490 A_2	492–94 A_2	496–6 A_2	508–10 A_2	**$\mathbf{A_1 = 108}$**
114–15 A_2	118–19 A_2	122–23 A_2	129–131 A_1A_2		133–135 A_1A_2		137–138 A_1A_2		139 A_2	141 A_2	142 A_1A_2
143 A_2	145–147 A_1A_2		149 $A_1A_2^2$	150–151 A_1A_2		153 $A_1A_2^3$	154–55 A_2	157–59 A_2	161 A_1A_2	163 A_1A_2	
165–167 A_1A_2		169 A_1A_2	170–71 A_2	173–75 A_2	177 A_2	179 $A_1A_2^4$	181–82 A_2	183 $A_1A_2^3$	185–87 A_2	189–91 A_2	193 A_1A_2
195 A_1A_2	197 A_2	198–199 A_1A_2		201 A_1A_2	203 A_1A_2	205 A_2	206 A_1A_2	207 A_2	209 A_1A_2	211 A_1A_2	213 $A_1A_2^4$
214 A_1A_2	215 $A_1A_2^2$	217 A_1A_2	219 A_2	221–23 A_2	225 A_1A_2	227 A_1A_2	229 A_2	231 A_2	233 A_1A_2	235 A_2	241 A_2
243 A_2	245 A_2	247 A_2	249 A_2	251 A_2	259 A_1A_2	263 A_1A_2	267 A_2	271 A_1A_2	275 $A_1A_2^2$	279 $A_1A_2^2$	283 A_2
287 A_2	291 A_1A_2	295 A_1A_2	299 A_2	303 $A_1A_2^3$	307 $A_1A_2^3$	311 $A_1A_2^2$	315 A_2	319 A_2	323 $A_1A_2^2$	327 A_2	331 $A_1A_2^4$
335 A_2	339 $A_1A_2^3$	343 A_2	347 A_2	351 A_2	355 A_2	359 A_2	363 A_2	371 A_2	375 A_2	379 A_2	387 A_1A_2
391 A_1A_2	395 A_1A_2	399 A_2	403 A_1A_2	407 $A_1A_2^2$	411 A_2	415 A_2	423 A_1A_2	427 A_2	431 A_2	439 $A_1A_2^4$	443 A_2
447 A_2	455 A_2	463 A_2	471 $A_1A_2^3$	479 A_2	**$\mathbf{A_1 = 109}$**	110 A_1	114 A_1	115 $A_1A_2^2$	118 A_1	119 A_2	122–23 A_2
126 A_2	128–30 A_1	131 A_1A_2	132–34 A_1	135 A_1A_2	136–38 A_1	139 A_1A_2	140–42 A_1	143 A_1A_2	144–46 A_1	147 A_1A_2	148–50 A_1
151 A_1A_2	152–54 A_1	155 A_2	156 A_1	157–59 A_2	160–62 A_1	163 A_1A_2	164–66 A_1	167 A_1A_2	168–70 A_1	171 A_2	172–74 A_1
175 A_2	176–78 A_1	179 $A_1A_2^2$	180–82 A_1	183 $A_1A_2^2$	184–85 A_1	186–91 A_2	192 A_1	193–195 A_1A_2		196 A_1	
197–199 A_1A_2		200 A_1	201–203 A_1A_2		204 A_1	205–206 A_1A_2		207 A_2	208 A_1	209–211 A_1A_2	
212 A_1	213–215 A_1A_2		216 A_1	217–218 A_1A_2		219 A_2	220 $A_1A_2^2$	221–23 A_2	224 A_1	225–227 A_1A_2	
228 A_1	229–231 A_1A_2		232 A_1	233–234 A_1A_2		235 A_2	236 A_1	238 A_2	240 A_1	241 A_1A_2	242–47 A_2
248 A_1	249 A_1A_2	250–52 A_2	254 A_2	258 A_1	259 $A_1^2A_2$	262 A_1	263 A_1A_2	266 A_1	267 $A_1^2A_2$	270 A_1	271 A_1A_2
274 A_1	275 $A_1^2A_2$	278 A_1	279 A_1A_2	282 A_1	283 A_2	286 A_1	287 A_2	290 A_1	291 $A_1^2A_2$	294 A_1	295 A_1A_2
298 A_1	299 $A_1A_2^2$	302 A_1	303 A_1A_2	306 A_1	307 $A_1A_2^2$	310 A_1	311 A_1A_2	314 A_1	315 A_2	318 $A_1A_2^4$	319 A_2
322 A_1	323 A_1A_2	326–327 A_1A_2		330 A_1	331 A_1A_2	334–35 A_2	338 A_1	339 A_1A_2	342–343 $A_1A_2^2$		346 $A_1A_2^4$

347 A_2	350–51 A_2	354 A_1	355 A_1A_2	358–59 A_2	362 A_1	363 A_2	366 A_2	370–71 A_2	374–75 A_2	378–79 A_2	382 A_2
384–86 A_1	387 A_1A_2	388 A_1	389–391 A_1A_2		392–94 A_1	395 A_1A_2	396 A_1	397 $A_1A_2^2$	398–399 A_1A_2		400–2 A_1
403 A_1A_2	404 A_1	405 $A_1A_2^2$	406–407 A_1A_2		408 A_1	409 $A_1A_2^3$	410 $A_1A_2^2$	411–15 A_2	416–18 A_1	419 A_1A_2	420 A_1
421 $A_1A_2^2$	422–423 A_1A_2		424–25 A_1	426–38 A_2	439 $A_1A_2^2$	440–47 A_2	448 A_1	449–451 A_1A_2		452 $A_1A_2^2$	453 A_2
454–455 A_1A_2		456 A_1	457–459 A_1A_2		460–61 A_2	462 $A_1A_2^2$	463 A_2	464 A_1	465–467 A_1A_2		468 $A_1A_2^2$
469 $A_1A_2^3$	470–471 $A_1A_2^2$		472 A_1	473–475 $A_1A_2^2$		476–79 A_2	480 A_1	481 A_1A_2	482 A_2	483 A_1A_2	484–87 A_2
488 A_1	489 A_1A_2	490–92 A_2	494 A_2	496–8 A_2	510 A_2	$\mathbf{A_1 = 110}$	112–14 A_1	115 A_2	116–18 A_1	119 A_2	120 A_1
121 A_1A_2	122–23 A_2	124 A_1	125 $A_1A_2^2$	128–34 A_1	135 A_1A_2	136–38 A_1	139 $A_1^2A_2$	140–42 A_1	143 A_2	144–46 A_1	147 A_1A_2
148–50 A_1	151 A_1A_2	152–53 A_1	154 $A_1A_2^2$	155 A_2	156 A_1	157–59 A_2	160–66 A_1	167 A_1A_2	168–70 A_1	171 A_2	172–74 A_1
175 A_2	176–78 A_1	179 $A_1A_2^2$	180–82 A_1	183 $A_1A_2^2$	184 A_1	185 $A_1A_2^3$	186–91 A_2	192–94 A_1	195 A_1A_2	196 A_1	197 $A_1^2A_2$
198–199 A_1A_2		200 A_1	201–203 A_1A_2		204 A_1	205 A_2	206 A_1A_2	207 A_2	208 A_1	209–211 A_1A_2	
212 A_1	213–218 A_1A_2		219 A_2	220 A_1A_2	221–23 A_2	224–25 A_1	226–227 A_1A_2		228 A_1	229 A_2	230 A_1A_2
231 A_2	232 A_1	233–234 A_1A_2		235 A_2	236 A_1	237 A_2	240 A_1	241 A_1A_2	242–47 A_2	248–249 A_1A_2	
250–53 A_2	258–62 A_1	263 A_1A_2	264–70 A_1	271 A_1A_2	274–78 A_1	279 A_1A_2	280–82 A_1	283 A_2	284–86 A_1	287 A_2	288–94 A_1
295 A_1A_2	296–2 A_1	303 $A_1A_2^2$	304–6 A_1	307 $A_1A_2^2$	308–10 A_1	311 $A_1A_2^2$	312–13 A_1	314 $A_1^2A_2^4$	315 A_2	316 A_1	317 A_1A_2
318 $A_1^2A_2^2$	319 A_2	320–22 A_1	323 $A_1^2A_2$	324 A_1	325 A_2	326 A_1	327 A_2	328–30 A_1	331 $A_1A_2^2$	332 A_1	333–35 A_2
336–38 A_1	339 $A_1A_2^2$	340 A_1	341 A_2	342 A_1A_2	343 A_2	344 A_1	345–346 A_1A_2		347 A_2	348 A_1	349–51 A_2
352–54 A_1	355 A_2	356 A_1	357–59 A_2	360 A_1	361 A_1A_2	362 A_1	363 A_2	364 A_1	365 A_2	368 A_1	369 $A_1A_2^2$
370–71 A_2	372 $A_1^2A_2^4$	373–75 A_2	376 A_1	377 $A_1A_2^2$	378–79 A_2	380 $A_1^2A_2^2$	381 A_2	384–86 A_1	387 A_1A_2	388–89 A_1	
390–391 A_1A_2		392–94 A_1	395 A_1A_2	396 A_1	397 A_2	398 A_1A_2	399 A_2	400–2 A_1	403 A_1A_2	404 A_1	405 $A_1A_2^2$
406–407 A_1A_2		408 A_1	409–410 $A_1A_2^2$		411–15 A_2	416–18 A_1	419 A_1A_2	420 A_1	421 $A_1A_2^3$	422–423 A_1A_2	
424–25 A_1	426–38 A_2	439 $A_1A_2^3$	440–47 A_2	448 A_1	449–451 A_1A_2		452 $A_1A_2^2$	453 A_2	454 A_1A_2	455 A_2	456 A_1
457–459 A_1A_2		460–63 A_2	464 A_1	465–467 A_1A_2		468 $A_1A_2^2$	469 A_2	470–471 $A_1A_2^2$		472–473 A_1A_2	
474–475 $A_1A_2^2$		476–79 A_2	480 A_1	481 $A_1A_2^2$	482–87 A_2	488 A_1	489 $A_1A_2^2$	490–93 A_2	496–4 A_2	505 $A_1A_2^3$	506–9 A_2
$\mathbf{A_1 = 111}$	112–22 A_1	123 A_2	124–26 A_1	128–58 A_1	159 A_2	160–86 A_1	187 A_2	188–90 A_1	191 A_2	192–6 A_1	207 A_1A_2
208–14 A_1	215 A_1A_2	216–18 A_1	219 A_1A_2	220–22 A_1	223 A_2	224–30 A_1	231 A_1A_2	232–34 A_1	235 A_1A_2	236–38 A_1	240–42 A_1
243 A_1A_2	244–46 A_1	247 A_1A_2	248–50 A_1	251 A_2	252 A_1	253–54 A_2	258–71 A_1	274–34 A_1	335 A_2	336–42 A_1	343 A_1A_2
344–46 A_1	347 A_1A_2	348–50 A_1	351 A_2	352–58 A_1	359 A_2	360–66 A_1	368–74 A_1	375 A_2	376–78 A_1	379 A_2	380–81 A_1
382 A_2	384–14 A_1	415 A_2	416–30 A_1	431 A_2	432–38 A_1	439 A_1A_2	440–41 A_1	442 A_2	444–47 A_2	448–54 A_1	455 A_1A_2
456–58 A_1	459 A_1A_2	460 A_1	461 A_2	462 A_1	463 A_2	464–66 A_1	467 A_1A_2	468–70 A_1	471 A_1A_2	472–74 A_1	475 A_1A_2
476 A_1	477 A_2	478 $A_1A_2^2$	479 A_2	480–82 A_1	483 A_1A_2	484 A_1	485 A_2	486 A_1	487 A_2	488–90 A_1	491 A_1A_2
492 A_1	493 A_2	496–97 A_1	498–0 A_2	502–3 A_2	504 A_1	505 A_1A_2	506–9 A_2	$\mathbf{A_1 = 113}$	114 A_2	118 A_2	122 A_2
130 $A_1^4A_2$	131 $A_1^3A_2$	132 $A_1^6A_2^2$	133 A_1A_2	134 $A_1^3A_2$	135 $A_1^2A_2$	138 $A_1^3A_2$	139 A_2	140 $A_1^5A_2^2$	141 A_2	142 $A_1^2A_2$	143 A_2
146–147 $A_1^2A_2$		148–149 A_1A_2		150 $A_1^2A_2$	151 $A_1^2A_2A_1A_2$		154 A_2	156–59 A_2	162 $A_1^3A_2$	163 $A_1^2A_2$	164 $A_1^4A_2^2$
165 $A_1A_2A_1A_2A_1A_2A_1A_2^2$			166 $A_1^2A_2$	167 A_1A_2	171–74 A_2	178 A_2	179 $A_1A_2^2A_1A_2^3A_1A_2^3$			180–82 A_2	183 $A_1A_2^2$
187–88 A_2	190–91 A_2	194 $A_1^3A_2$	195 $A_1^2A_2$	196 $A_1^4A_2^2$	197 A_2	198 $A_1^2A_2$	199 A_2	202 A_1A_2	203–7 A_2	210–211 A_1A_2	
212 $A_1A_2A_1A_2A_1A_2A_1A_2^2$			213 A_2	214 A_1A_2	215 $A_1A_2^2$	218 $A_1A_2^2$	220 A_2	223 A_2	226 A_1A_2	227 A_2	229–30 A_2
234 A_2	236 A_2	242 A_2	244 A_2	250 A_2	258 $A_1^5A_2$	259 $A_1^3A_2$	262 $A_1^3A_2$	263 A_1A_2	266 $A_1^4A_2$	270 A_1A_2	271 $A_1A_2^3$
274 $A_1^3A_2$	275 $A_1^2A_2A_1^2A_2^2$		278 $A_1^2A_2$	279 A_1A_2	286 A_2	290 $A_1^4A_2$	291 A_1A_2	294–295 A_1A_2		298 $A_1^2A_2$	299 $A_1A_2^7$
302 A_1A_2	303 $A_1A_2^2$	306 A_1A_2	307 $A_1A_2^2$	310 A_1A_2	311 $A_1A_2^2$	314 $A_1A_2^7$	318 $A_1A_2^3$	319 A_2	322 $A_1^4A_2$	323 A_1A_2	326 A_2
330 $A_1^2A_2$	331 $A_1A_2^7$	334–35 A_2	338 A_1A_2	339 $A_1A_2^2$	342 A_2	346 $A_1A_2^7$	354–55 A_2	358–59 A_2	362 A_2	367 A_2	370 A_2
382 A_2	386 $A_1^3A_2$	387 $A_1^2A_2$	388 $A_1^3A_2^2$	389 $A_1A_2^2$	390 $A_1^2A_2$	391 A_1A_2	394 A_1A_2	395–98 A_2	402–403 A_1A_2		
404–405 $A_1A_2^2$		406–407 A_1A_2		410 $A_1A_2^3$	412 A_2	415 A_2	418–20 A_2	421 $A_1A_2^4$	422 A_2	423 $A_1A_2^2$	426 A_2
428 A_2	431 A_2	439 A_2	442 A_2	444–47 A_2	450–451 A_1A_2		452 A_2	454 A_2	458 A_1A_2	459 $A_1A_2^3$	460–61 A_2
463 A_2	466 A_1A_2	467 $A_1A_2^2$	468 $A_1A_2^4$	470 $A_1A_2^2$	471 A_2	474 $A_1A_2^2$	475 A_2	477–79 A_2	482 A_2	485–87 A_2	491–93 A_2
498 A_2	500 A_2	502 A_2	506 A_2	508 A_2	$\mathbf{A_1 = 115}$	116–18 A_1	120 A_1	121 $A_1^2A_2$	122 A_2	124 $A_1^3A_2$	125 $A_1^2A_2^2$
128–42 A_1	143 A_2	144–54 A_1	156 A_1	157 A_1A_2	158–59 A_2	160–70 A_1	171 A_2	172 A_1	173 $A_1^2A_2$	174 A_1	176–82 A_1
183 $A_1^2A_2A_1A_2A_1A_2$			184 A_1	185 $A_1^2A_2A_1A_2A_1A_2$			187–88 A_2	190–91 A_2	192–2 A_1	203 $A_1^2A_2$	204 A_1
205 A_2	206 A_1	207 A_2	208–14 A_1	215 $A_1^2A_2A_1A_2A_1A_2$			216 A_1	217–218 A_1A_2		220 $A_1^2A_2$	223 A_2
224–28 A_1	229 A_2	230 A_1	232 A_1	233 $A_1^3A_2$	234 A_1	236 A_1	240–41 A_1	242 A_2	244 A_2	248 $A_1^2A_2$	249 $A_1^2A_2^2$
250 A_2	253 A_2	258–70 A_1	271 $A_1A_2^2$	274–82 A_1	284 A_1	285 A_1A_2	286 A_1	288–98 A_1	299 A_1A_2	300–2 A_1	303 A_1A_2
304–10 A_1	311 A_1A_2	312 A_1	313 $A_1^2A_2$	314 $A_1^2A_2^2$	316 A_1	317 $A_1^2A_2A_1A_2$		318 $A_1^2A_2^2$	319 $A_1A_2^2$	320–24 A_1	326 A_1
328–30 A_1	331 $A_1^2A_2^2$	332 A_1	334–35 A_2	336–40 A_1	342 A_1	344 A_1	345 $A_1^2A_2$	346 A_1A_2	348 A_1	352–56 A_1	358–59 A_2
360 A_1	361 $A_1^3A_2$	362 A_1	364 A_1	367 A_2	368–70 A_1	372 A_1	376 $A_1^3A_2$	377 $A_1^2A_2$	380 $A_1^2A_2^2$	381 $A_1^2A_2^4$	382 A_2
384–98 A_1	400–6 A_1	407 A_1A_2	408 A_1	409 A_1A_2	410 $A_1A_2^2$	412 A_2	415 A_2	416–22 A_1	423 $A_1A_2^2$	424–25 A_1	426 A_2
428 A_2	431 A_2	439 A_2	442 A_2	444–47 A_2	448–52 A_1	454 A_1	456–58 A_1	459 $A_1^2A_2^2$	460–61 A_2	463 A_2	464–66 A_1
467 A_1A_2	468 A_1	470 $A_1A_2^2$	471 A_2	472 A_1	473 $A_1^2A_2A_1A_2$		474 A_1A_2	475 $A_1A_2^2$	477–79 A_2	480–81 A_1	482 A_2
485–87 A_2	488 A_1	489 $A_1^2A_2^2$	491–93 A_2	498 A_2	500 A_2	502 A_2	505 $A_1^2A_2^4$	506 A_2	508–9 A_2	$\mathbf{A_1 = 117}$	118 A_1
122–23 A_2	128–30 A_1	131 $A_1^6A_2$	132–34 A_1	135 $A_1^4A_2$	136–38 A_1	139 $A_1^4A_2$	140–42 A_1	143 A_2	144–46 A_1	147 $A_1^4A_2$	148–50 A_1
151 $A_1^2A_2$	152–53 A_1	154 $A_1A_2^2$	156 A_1	157–59 A_2	160–62 A_1	163 $A_1^5A_2$	164–66 A_1	167 $A_1^3A_2A_1^2A_2$		168–70 A_1	171 A_2
172–74 A_1	176–78 A_1	179 $A_1^2A_2^2$	180–82 A_1	183 $A_1^2A_2^2$	184 A_1	185 $A_1A_2A_1A_2^3$		187–88 A_2	190–91 A_2	192 A_1	
193 $A_1^7A_2A_1A_2$		194 A_1	195 A_1A_2	196 A_1	197 A_1A_2	198 $A_1^4A_2$	199 A_1A_2	200 A_1	201–203 A_1A_2		204 A_1
205 A_2	206 A_1A_2	207 A_2	208 A_1	209–211 A_1A_2		212 A_1	213–218 A_1A_2		220 A_1A_2	223 A_2	224 A_1
225 A_1A_2	226 $A_1^7A_2A_1A_2$		227 A_1A_2	228 A_1	229 A_2	230 A_1A_2	232 A_1	233–234 A_1A_2		236 A_1	240 A_1
241 A_1A_2	242 A_2	244 A_2	248–249 A_1A_2		250–51 A_2	258 A_1	259 $A_1^8A_2$	262 A_1	263 $A_1^3A_2$	266 A_1	267 $A_1^6A_2$
270 A_1	271 A_1A_2	274 A_1	275 $A_1^6A_2$	278 A_1	279 $A_1^3A_2A_1A_2$		282 A_1	286 A_1	290 A_1	291 $A_1^7A_2$	294 A_1
295 A_1A_2	298 A_1	299 $A_1^2A_2^2$	302 A_1	303 $A_1A_2^2$	306 A_1	307 $A_1^5A_2^2$	310 A_1	311 A_1A_2	314 $A_1A_2^6$	318 $A_1A_2^3$	319 A_2
322 A_1	323 A_1A_2	326 $A_1^4A_2$	330 A_1	331 $A_1A_2^2$	334–35 A_2	338 A_1	339 A_1A_2	342 $A_1^2A_2^2$	346 $A_1A_2^3$	354 A_1	355 A_1A_2
358–59 A_2	362 A_1	367 A_2	370 A_2	379 A_2	382 A_2	384–86 A_1	387 $A_1^4A_2$	388 A_1	389 $A_1^3A_2A_1^3A_2A_1^2A_2$		
390 $A_1^6A_2$	391 $A_1^2A_2$	392–94 A_1	395 A_1A_2	396 A_1	397 A_2	398 $A_1^2A_2$	400–2 A_1	403 $A_1^3A_2A_1A_2$		404 A_1	405 $A_1^3A_2^2$
406 $A_1^3A_2A_1^3A_2A_1^2A_2$			407 $A_1^2A_2A_1A_2$		408 A_1	409–410 $A_1A_2^2$		412 A_2	415 A_2	416–18 A_1	419 $A_1^3A_2$
420 A_1	421 $A_1^2A_2^2$	422 $A_1^4A_2$	423 A_1A_2	424–25 A_1	426 A_2	428 A_2	431 A_2	439 A_2	442 A_2	444–47 A_2	448 A_1
449 A_1A_2	450 $A_1^3A_2$	451 A_1A_2	452 $A_1^3A_2^2$	454 $A_1^2A_2$	456 A_1	457–459 A_1A_2		460–61 A_2	463 A_2	464 A_1	
465–467 A_1A_2		468 $A_1A_2^2$	470 $A_1A_2A_1A_2^2$		471 $A_1A_2^2$	472–473 A_1A_2		474–475 $A_1A_2^2$		477–79 A_2	480 A_1
481 A_1A_2	482 A_2	485–87 A_2	488 A_1	489 A_1A_2	491–93 A_2	498–0 A_2	502 A_2	505–8 A_2	$\mathbf{A_1 = 118}$	120–121 A_1A_2	
122–23 A_2	124–125 A_1A_2		128–42 A_1	143 A_2	144–50 A_1	151 $A_1^2A_2$	152–154 A_1A_2		156 A_1A_2	157 $A_1A_2^2$	158–59 A_2
160–70 A_1	171 A_2	172–74 A_1	176–78 A_1	179 $A_1A_2^2$	180–82 A_1	183 $A_1A_2^2$	184 A_1A_2	185 $A_1A_2^2$	187–88 A_2	190–91 A_2	192–98 A_1
199 $A_1^2A_2$	200–204 A_1A_2		205 A_2	206 A_1A_2	207 A_2	208–214 A_1A_2		215 $A_1^2A_2^2A_1A_2$		216–218 A_1A_2	
220 A_1A_2	223 A_2	224–26 A_1	227 $A_1^2A_2$	228 A_1	229 A_2	230 A_1	232–234 A_1A_2		236 A_1A_2	240–241 A_1A_2	
242 A_2	244 A_2	248–249 A_1A_2		250–51 A_2	253 A_2	258–70 A_1	271 $A_1A_2^4$	274–82 A_1	284–86 A_1	288–2 A_1	303 $A_1A_2^2$
304–10 A_1	311 A_1A_2	312 A_1	313 $A_1^2A_2$	314 $A_1A_2^2$	316 $A_1^2A_2$	317 A_1A_2	318 $A_1A_2^2$	319 A_2	320–24 A_1	326 A_1	328–30 A_1
331 $A_1A_2^2$	332 A_1	334–35 A_2	336–38 A_1	339 $A_1A_2^2$	340 A_1	342 A_1	344–346 A_1A_2		348 A_1A_2	352–54 A_1	355 A_2
356 A_1	358–59 A_2	360 A_1	361–362 $A_1^2A_2$		364 $A_1^2A_2$	367 A_2	368 A_1	369 $A_1A_2^2$	370 A_2	372 $A_1^2A_2^3$	
376–377 A_1A_2		379 A_2	380 $A_1^2A_2A_1A_2^2$		381 A_2	384–94 A_1	395 $A_1A_2^2$	396 A_1	397 A_2	398 A_1	400–2 A_1
403 $A_1^2A_2$	404–6 A_1	407–408 A_1A_2		409–410 $A_1A_2^2$		412 $A_1A_2^2$	415 A_2	416–20 A_1	421 $A_1A_2^4$	422 A_1	423 $A_1A_2^2$
424 A_1	425 $A_1A_2^2$	426 A_2	428 A_2	431 A_2	439 A_2	442 A_2	444–47 A_2	448–50 A_1	451 $A_1^2A_2$	452 A_1	454 A_1
456–458 A_1A_2		459 $A_1A_2^2$	460–61 A_2	463 A_2	464–468 A_1A_2		470 A_1A_2	471 A_2	472–474 A_1A_2		475 $A_1A_2^2$
477–79 A_2	480 $A_1^2A_2^2$	481 $A_1A_2^2$	482 A_2	485–87 A_2	488 A_1A_2	489 $A_1A_2^2$	491–93 A_2	498–0 A_2	505 $A_1A_2^2$	506–9 A_2	$\mathbf{A_1 = 119}$
121 A_1	123 A_2	125 $A_1^2A_2A_1A_2$		146–47 A_1	150–51 A_1	154–55 A_1	158 A_1	159 A_2	178–79 A_1	182–83 A_1	186 A_1

187 A_2	190–91 A_2	201 A_1	203 A_1A_2	205 A_1	207 A_2	210–11 A_1	214–15 A_1	217–219 A_1A_2		221–222 A_1A_2	
223 A_2	233 A_1	235 $A_1A_2^2$	237 $A_1^2A_2A_1A_2$		242 A_1	243 A_1A_2	246 A_1	249–250 A_1A_2		251 A_2	253 $A_1A_2^5$
292–95 A_1	300–3 A_1	308–11 A_1	316–18 A_1	319 $A_1A_2^2$	329 A_1	331 A_1	333 A_1	335 A_2	345 A_1	347 A_1A_2	
349 $A_1^2A_2A_1A_2$		356–58 A_1	359 A_2	361 A_1	363 A_1A_2	364 A_1	365 $A_1^2A_2$	366 A_1	367 A_2	372 A_1	373 $A_1^2A_2^3$
374 A_1	377 $A_1^2A_2$	379 A_2	380 A_1	381 $A_1^2A_2^2$	382 A_2	402–3 A_1	406–7 A_1	410 A_1	411 $A_1A_2^2$	414 A_1	415 A_2
420–23 A_1	428–30 A_1	431 A_2	434–39 A_1	442 A_2	444–47 A_2	457 A_1	459 A_1A_2	461 A_2	463 A_2	466 A_1	467 A_1A_2
470 A_1	471 A_1A_2	473–475 A_1A_2		477–79 A_2	484 A_1	485–87 A_2	489 $A_1^2A_2$	491 $A_1A_2^2$	492–93 A_2	498–0 A_2	502 A_2
505 A_1A_2	506–9 A_2	**$A_1 = 121$**	122 A_2	126 A_2	130–131 $A_1^2A_2$		132 $A_1^4A_2^2$	133 $A_1^2A_2^2$	134 $A_1^2A_2$	135 A_1A_2	138 $A_1^2A_2$
139 A_1A_2	140 $A_1^3A_2^2$	141 $A_1A_2^2$	142–143 A_1A_2		146–147 A_1A_2		148 $A_1^2A_2^2$	149 $A_1A_2A_1A_2^2$		150–151 A_1A_2	
154 A_1A_2	155 A_2	156 $A_1A_2^2$	157 A_2	158 A_1A_2	159 A_2	162 $A_1^2A_2$	163 A_1A_2	164 $A_1^3A_2^2$	165 $A_1^2A_2^2A_1A_2^2$		
166–167 A_1A_2		170–171 A_1A_2		172 $A_1^2A_2^2$	173 $A_1A_2^2$	174 A_1A_2	175 A_2	178–179 A_1A_2		180–181 $A_1A_2^2$	
182–183 A_1A_2		187–91 A_2	194 $A_1^2A_2$	195 A_1A_2	196 $A_1^3A_2^2$	197 $A_1A_2^2$	198–199 A_1A_2		202–203 A_1A_2		204 $A_1^2A_2^2$
205 A_2	206 A_1A_2	207 A_2	210–211 A_1A_2		212 $A_1^2A_2^2A_1A_2^2$		213 $A_1A_2^2$	214–215 A_1A_2		218 A_1A_2	219 A_2
220 $A_1A_2^2$	221–23 A_2	226–227 A_1A_2		228 $A_1A_2^2$	229 A_2	230 A_1A_2	231 A_2	234 A_1A_2	235–37 A_2	242 A_1A_2	243–44 A_2
246–47 A_2	250 A_2	252 A_2	258 $A_1^3A_2$	259 $A_1^2A_2$	262 $A_1^2A_2$	263 A_1A_2	266 $A_1^2A_2$	267 A_1A_2	270–271 A_1A_2		274 $A_1^2A_2$
275 A_1A_2	278–279 A_1A_2		282 A_1A_2	286 A_1A_2	287 A_2	290 $A_1^2A_2$	291 A_1A_2	294–295 A_1A_2		298 $A_1^2A_2$	299 A_1A_2
302–303 A_1A_2		306–307 A_1A_2		310–311 A_1A_2		314 A_1A_2	315 A_2	318 A_1A_2	319 $A_1A_2^2$	322 $A_1^2A_2$	323 A_1A_2
326 A_1A_2	327 A_2	330 $A_1^2A_2$	331 A_1A_2	334–35 A_2	338–339 A_1A_2		342 A_1A_2	343 A_2	346 A_1A_2	347 A_2	354 $A_1^2A_2$
355 A_2	358–59 A_2	362–63 A_2	366–67 A_2	370 A_2	374–75 A_2	378 A_2	382 A_2	386 $A_1^2A_2$	387 A_1A_2	388 $A_1^2A_2^2$	389 $A_1A_2^2$
390–391 A_1A_2		394–395 A_1A_2		396 $A_1A_2^2$	397 A_2	398 A_1A_2	399 A_2	402–403 A_1A_2		404 $A_1A_2^2$	
405 $A_1A_2^2A_1A_2^2A_1A_2^3$			406–407 A_1A_2		410 A_1A_2	411–12 A_2	414–15 A_2	418–419 A_1A_2		420 A_2	421 $A_1A_2^2$
422–423 A_1A_2		426 A_2	428–31 A_2	434–38 A_2	439 $A_1A_2^2$	442 A_2	444–47 A_2	450–451 A_1A_2		452–53 A_2	454 A_1A_2
455 A_2	458–459 A_1A_2		460–63 A_2	466–467 A_1A_2		468 $A_1A_2^2$	469 A_2	470 A_1A_2	471 $A_1A_2^2$	474 A_1A_2	475 $A_1A_2^2$
476–79 A_2	482–83 A_2	485–87 A_2	490–93 A_2	498–0 A_2	502–3 A_2	506 A_2	508 A_2	**$A_1 = 123$**	124–26 A_1	128–58 A_1	159 A_1A_2
160–86 A_1	187 A_2	188–90 A_1	191 A_2	192–18 A_1	219 A_1A_2	220–22 A_1	223 A_2	224–38 A_1	240–46 A_1	247 $A_1A_2^2$	248–50 A_1
252 A_1	253 A_2	258–71 A_1	274–18 A_1	319 A_1A_2	320–34 A_1	335 A_2	336–50 A_1	352–66 A_1	367 A_2	368–74 A_1	375 A_2
376–78 A_1	380–81 A_1	382 A_2	384–14 A_1	415 A_2	416–30 A_1	431 A_2	432–38 A_1	439 A_1A_2	440–41 A_1	442 A_2	444 A_1
445–47 A_2	448–62 A_1	463 A_2	464–70 A_1	471 A_1A_2	472–74 A_1	475 A_1A_2	476 A_1	477–79 A_2	480–84 A_1	485 A_2	486 A_1
487 A_2	488–90 A_1	491 A_2	492 A_1	493 A_2	496–98 A_1	499–0 A_2	502–3 A_2	504–5 A_1	506 A_2	508–9 A_2	**$A_1 = 124$**
129 $A_1^3A_2$	130–131 $A_1^2A_2$		133–134 $A_1^2A_2$		135 A_1A_2	137 $A_1^2A_2A_1A_2$		138–139 $A_1^2A_2$		141–142 A_1A_2	
143 A_2	145–147 A_1A_2		149–151 A_1A_2		153–154 A_1A_2		155 A_2	157 A_2	158 A_1A_2	159 A_2	161 $A_1^3A_2$
163 A_1A_2	165–167 A_1A_2		169–170 A_1A_2		171 A_2	173 A_2	174 A_1A_2	177 A_2	179 A_1A_2	181 $A_1A_2^2A_1A_2^3$	
182 A_1A_2	183 $A_1A_2^2$	185 A_1A_2	187 A_2	190–91 A_2	193 A_1A_2	195 A_1A_2	197 A_2	198–199 A_1A_2		201 A_1A_2	203 A_1A_2
205 A_2	206 A_1A_2	207 A_2	209 A_1A_2	211 A_1A_2	213–215 A_1A_2		217 A_1A_2	219 A_2	221–23 A_2	225 A_1A_2	227 A_1A_2
229 A_2	233 A_1A_2	235 A_2	237 A_2	241 A_1A_2	243 A_2	247 A_2	249 A_1A_2	251 A_2	259 $A_1^2A_2$	263 A_1A_2	267 A_2
271 A_1A_2	275 A_1A_2	279 A_1A_2	291 A_1A_2	295 A_1A_2	299 A_2	303 $A_1A_2^3$	307 $A_1A_2^2$	311 $A_1A_2^2$	319 A_2	323 $A_1A_2^2$	
331 $A_1A_2^2A_1A_2^2A_1A_2^3A_1A_2^4$			335 A_2	339 $A_1A_2^2$	347 A_2	355 A_2	359 A_2	363 A_2	367 A_2	375 A_2	379 A_2
387 A_1A_2	391 A_1A_2	395 A_1A_2	403 A_1A_2	407 A_1A_2	411 A_2	415 A_2	423 A_1A_2	431 A_2	439 $A_1A_2^2$	447 A_2	463 A_2
471 $A_1A_2^2$	479 A_2	**$A_1 = 125$**	126 A_2	128 A_1	129 $A_1^6A_2$	130 $A_1^4A_2$	131 $A_1^2A_2$	132 A_1	133–134 $A_1^3A_2$		135 $A_1^2A_2$
136 A_1	137 $A_1^5A_2$	138 $A_1^3A_2$	139 $A_1^2A_2$	140 A_1	141–142 $A_1^2A_2$		143 A_1A_2	144 A_1	145–146 $A_1^3A_2$		147 $A_1^2A_2$
148 $A_1^6A_2^2$	149–150 $A_1^2A_2$		151 A_1A_2	152 A_1	153–155 A_1A_2		156 $A_1^3A_2^2$	157 $A_1A_2A_1A_2A_1A_2^2$			158 A_1A_2
159 A_2	160 A_1	161 $A_1^5A_2$	162 $A_1^3A_2$	163 $A_1^2A_2$	164 A_1	165 $A_1^3A_2A_1^2A_2$		166 $A_1^3A_2$	167 $A_1^2A_2$	168 A_1	169 $A_1^5A_2$
170 $A_1^3A_2$	171 A_1A_2	172 A_1	173–174 $A_1^2A_2$		175 A_1A_2	176 A_1	177 $A_1^3A_2A_1A_2$		178 $A_1^2A_2$	179 A_1A_2	180 $A_1^3A_2^2$
181 $A_1^2A_2^2$	182 $A_1^2A_2$	183 A_1A_2	184 A_1	185 A_1A_2	186–91 A_2	192 A_1	193 $A_1^3A_2A_1A_2$		194 $A_1^3A_2$	195 A_1A_2	196 $A_1^4A_2$
197 A_1A_2	198 $A_1^2A_2$	199 A_1A_2	200 A_1	201–203 A_1A_2		204 $A_1^4A_2$	205–207 A_1A_2		208 $A_1^7A_2A_1A_2$		
209–211 A_1A_2		212 $A_1^3A_2^2$	213–219 A_1A_2		220 $A_1^2A_2^2A_1A_2$		221 A_2	222 A_1A_2	223 A_2	224 A_1	225 A_1A_2
226 $A_1^3A_2$	227 A_1A_2	228 $A_1^4A_2$	229 A_1A_2	230 $A_1^2A_2$	231 A_1A_2	232 A_1	233–235 A_1A_2		236 $A_1^2A_2^2$	237 A_2	238 A_1A_2
240 $A_1^5A_2A_1A_2$		241–243 A_1A_2		244–45 A_2	246 A_1A_2	247 $A_1A_2^2$	248–249 A_1A_2		250–52 A_2	258 $A_1^5A_2$	259 $A_1^3A_2$
262 $A_1^3A_2$	263 $A_1^2A_2A_1A_2$		266 $A_1^5A_2$	267 $A_1^2A_2$	270 $A_1^3A_2$	271 A_1A_2	274 $A_1^4A_2$	275 $A_1^2A_2$	278 $A_1^3A_2$	279 A_1A_2	282 $A_1^3A_2$
283 A_2	286–287 A_1A_2		290 $A_1^5A_2$	291 $A_1^2A_2$	294 $A_1^3A_2$	295 A_1A_2	298 $A_1^4A_2$	299 $A_1^2A_2$	302 $A_1^3A_2$	303 A_1A_2	306 $A_1^3A_2$
307 A_1A_2	310–311 A_1A_2		314 A_1A_2	315 A_2	318 A_1A_2	319 $A_1A_2^2$	322 $A_1^4A_2$	323 $A_1^2A_2$	326 $A_1^2A_2$	327 A_1A_2	330 $A_1^3A_2$
331 A_1A_2	334 $A_1^2A_2$	335 A_2	338 $A_1^2A_2$	339 A_1A_2	342 $A_1^2A_2A_1A_2$		343 A_1A_2	346 A_1A_2	347 $A_1A_2^2$	350 A_2	354 $A_1^3A_2$
355 A_1A_2	358 $A_1^2A_2$	359 A_2	362 $A_1^2A_2$	363 A_2	366–67 A_2	370 $A_1^2A_2$	371 A_1A_2	374–75 A_2	378–79 A_2	382 A_2	384 A_1
385 $A_1^4A_2$	386 $A_1^3A_2$	387 $A_1^2A_2$	388 $A_1^5A_2^2$	389–391 $A_1^2A_2$		392 A_1	393 $A_1^3A_2$	394 $A_1^2A_2$	395 A_1A_2	396 $A_1^4A_2^2$	397 $A_1^2A_2^2$
398 $A_1^2A_2$	399 A_1A_2	400 A_1	401 $A_1^3A_2A_1A_2$		402 $A_1^2A_2$	403 A_1A_2	404 $A_1^3A_2^2$	405 $A_1^2A_2^2$	406 $A_1^2A_2$	407 A_1A_2	408 $A_1^5A_2^2$
409–411 A_1A_2		412 $A_1^2A_2^2$	413 $A_1A_2^3$	414 $A_1A_2^2$	415 A_2	416 A_1	417–418 $A_1^3A_2$		419 $A_1^2A_2$	420–421 $A_1^2A_2^2$	
422 $A_1^2A_2$	423 A_1A_2	424 A_1	425 $A_1^3A_2$	426 $A_1^2A_2$	427 A_1A_2	428–34 A_2	435 A_1A_2	436–38 A_2	439 A_1A_2	440–42 A_2	444–47 A_2
448 $A_1^6A_2$	449 A_1A_2	450 $A_1^2A_2$	451 A_1A_2	452 $A_1^2A_2^2$	453 A_2	454 $A_1^2A_2$	455 A_1A_2	456 $A_1^5A_2$	457–459 A_1A_2		460 $A_1^2A_2^2$
461 A_2	462 $A_1A_2^2$	463 A_2	464 $A_1^3A_2A_1^3A_2A_1^2A_2$			465–467 A_1A_2		468 $A_1^2A_2^2$	469 $A_1A_2^3$		
470 $A_1^2A_2^2A_1A_2A_1A_2A_1A_2$			471–475 A_1A_2		476–77 A_2	478 $A_1A_2^2$	479 A_2	480 $A_1^5A_2$	481 A_1A_2	482 $A_1^2A_2$	483 A_1A_2
484–87 A_2	488 $A_1^4A_2$	489 A_1A_2	490–93 A_2	496–0 A_2	502–8 A_2	**$A_1 = 126$**	146–47 A_1	150–51 A_1	154 A_1	155 $A_1^2A_2$	158 A_1
159 A_2	178–79 A_1	182 A_1	183 A_1A_2	186 A_1	187 A_2	190–91 A_2	201 A_1	203 $A_1^2A_2$	205 A_1	207 A_2	210 A_1
211 $A_1^2A_2$	214 A_1	215 A_1A_2	217–219 A_1A_2		221–222 A_1A_2		223 A_2	233 A_1	235 $A_1^2A_2$	237 A_1	242 A_1
243 A_1A_2	246 A_1A_2	247 $A_1A_2^3$	249–250 A_1A_2		251 A_2	253 A_2	292–95 A_1	300–3 A_1	308–11 A_1	316–18 A_1	319 $A_1A_2^2$
329 A_1	331 A_1	333 A_1	335 A_2	345 A_1	347 $A_1A_2^2$	349 A_1	356–58 A_1	359 A_2	361 A_1	363–66 A_1	367 A_2
372–74 A_1	375 A_2	377 A_1	379 A_2	380–81 A_1	402–3 A_1	406 A_1	407 A_1A_2	410 A_1	411 A_1A_2	414 $A_1A_2A_1A_2^2$	
415 A_2	420–23 A_1	428–30 A_1	431 A_2	434 A_1	435 A_1A_2	436 A_1	437–438 A_1A_2		439 $A_1A_2^2$	442 A_2	444–47 A_2
457 A_1	459 $A_1^2A_2$	461 A_2	463 A_2	466 A_1	467 A_1A_2	470–471 A_1A_2		473–475 A_1A_2		477 A_2	478 $A_1A_2^2$
479 A_2	484 A_1	485–87 A_2	489 A_1	491–93 A_2	498–0 A_2	502–3 A_2	505 $A_1A_2^2$	506–9 A_2	**$A_1 = 127$**	128–18 A_1	219 A_1A_2
220–22 A_1	223 A_1A_2	224–50 A_1	251 A_1A_2	252–54 A_1	258–71 A_1	274–82 A_1	384–46 A_1	447 A_2	448–74 A_1	475 A_1A_2	476–78 A_1
479 A_2	480–94 A_1	496–2 A_1	503 A_2	504–6 A_1	507 A_2	508 A_1	509 A_2	**$A_1 = 238$**	247 A_2	311 A_1A_2	319 $A_1A_2^2$
375 A_2	381 $A_1A_2^2$	383 A_2	**$A_1 = 239$**	319 A_1	381 A_1	383 A_2	438–39 A_1	446 A_1	447 A_2	**$A_1 = 245$**	303 A_1A_2
311 A_1A_2	319 $A_1A_2^2$	359 A_2	367 A_2	375 A_2	377 A_1	379 A_2	380 A_1	381 A_1A_2	382–83 A_2	486–87 A_2	**$A_1 = 247$**
248 A_1	249 $A_1^2A_2$	250 A_1A_2	251 A_2	252 $A_1^2A_2$	253 A_1A_2	258–71 A_1	274–14 A_1	315 $A_1^3A_2$	316 A_1	317 A_1A_2	318 A_1
319 A_1A_2	320–46 A_1	347 $A_1^3A_2$	348 A_1	349 $A_1^2A_2$	350 A_1	352–62 A_1	363 $A_1^2A_2$	364 A_1	365 $A_1^2A_2$	366 A_1	367 A_2
368–74 A_1	375 A_2	376 A_1	377–378 $A_1^2A_2$		379 A_1A_2	380 $A_1^2A_2$	381–382 A_1A_2		383 A_2	384–14 A_1	415 A_2
416–30 A_1	431 A_1A_2	432–40 A_1	441 $A_1^2A_2$	442 A_1	444 A_1	445 A_1A_2	446–47 A_2	448–62 A_1	463 A_2	464–72 A_1	473 A_1A_2
474 A_1	475 A_1A_2	476 A_1	477–478 A_1A_2		479 A_2	480–86 A_1	487 A_2	488 A_1	489 $A_1^2A_2$	490 A_1	491 A_1A_2
492 $A_1^2A_2$	493 A_2	496–98 A_1	499 A_2	500 A_1	502 A_2	504 $A_1^2A_2$	505 A_1A_2	506–9 A_2	**$A_1 = 275$**	332 A_2	334–35 A_2
348 A_2	352 $A_1^3A_2^2$	353 $A_1^2A_2^2A_1A_2^2$		354–56 A_2	358–59 A_2	360 $A_1^2A_2$	361 A_1A_2	362 A_2	364 A_2	367 A_2	
368 $A_1^2A_2^2A_1A_2^2$		369 $A_1A_2^3$	370 A_2	372 $A_1A_2^6$	376 A_1A_2	377 $A_1A_2A_1A_2^2$		380 $A_1A_2A_1A_2^3$		381–82 A_2	396–98 A_2
412 A_2	424–26 A_2	428 A_2	431 A_2	442 A_2	444–46 A_2	460–61 A_2	463 A_2	477–78 A_2	480 A_2	481 $A_1A_2^6$	482 A_2
485–88 A_2	489 $A_1A_2A_1A_2^3$		491–93 A_2	498 A_2	500 A_2	502 A_2	505–6 A_2	508–9 A_2	**$A_1 = 279$**	344–346 A_1A_2	
347 A_2	368 A_1A_2	369 $A_1A_2A_1A_2^2$		370 A_2	372 $A_1A_2A_1A_2^3$		373–74 A_2	376–377 A_1A_2		379 A_2	380 A_1A_2
381 $A_1A_2^2$	382 A_2	442 A_2	444–46 A_2	505 $A_1A_2^2$	506–7 A_2	**$A_1 = 283$**	359 A_2	367 A_2	375 A_2	377 A_1	380–81 A_1
382 A_2	486–87 A_2	503 A_2	**$A_1 = 285$**	322 $A_1^2A_2$	323 A_1A_2	326 A_2	330 $A_1^2A_2A_1^2A_2A_1A_2$			331 $A_1A_2A_1A_2^2$	
334–35 A_2	338 $A_1^2A_2$	339 A_1A_2	342 $A_1^2A_2^3$	346 $A_1^2A_2^3$	354 $A_1^2A_2$	355 A_1A_2	358–59 A_2	362 A_2	367 A_2	370 A_2	375 A_2
379 A_2	382 A_2	384 $A_1^5A_2$	385 $A_1^3A_2$	386 $A_1^4A_2$	387 $A_1^2A_2$	388 $A_1^5A_2$	389 $A_1^2A_2$	390 $A_1^3A_2$	391 $A_1^2A_2$	392 $A_1^5A_2$	393 $A_1^2A_2$
394 $A_1^3A_2$	395 A_1A_2	396 $A_1^3A_2^2$	397 A_2	398 $A_1^2A_2$	400 $A_1^5A_2^2$	401–402 $A_1^3A_2$		403 $A_1^2A_2A_1A_2$		404 $A_1^4A_2^2$	405 $A_1^2A_2^2$

406	$A_1^3A_2^2$	407	A_1A_2	408	$A_1^4A_2^2$	409–410	$A_1^2A_2^2$			412	A_2	416–18	A_2	419	$A_1^2A_2$	420	A_2	421	$A_1^2A_2^5$	422	$A_1^3A_2$	423	A_1A_2
424	A_2	425	$A_1^2A_2^5$	426	A_2	428	A_2	431	A_2	439	A_2	442	A_2	444	A_2	446	A_2	448	$A_1^3A_2$	449	$A_1^2A_2$	450	$A_1^3A_2$
451–452	$A_1^2A_2$			454	$A_1^2A_2$	456	$A_1^3A_2$	457	A_1A_2	458	$A_1^2A_2$	459	A_1A_2	460–61	A_2	463	A_2	464	$A_1^3A_2$	465	$A_1^2A_2A_1A_2$		
466	$A_1^3A_2A_1^2A_2A_1^2A_2$					467	$A_1^2A_2A_1A_2A_1A_2$					468	$A_1^2A_2^2$	470	$A_1^2A_2^2$	471	$A_1A_2^2$	472	$A_1^3A_2^2$	473	A_1A_2	474	$A_1^2A_2^2$
475	$A_1A_2^2$	478	A_2	480	$A_1^3A_2$	481	A_1A_2	482	A_2	485–87	A_2	488	$A_1^2A_2$	489	A_1A_2	491–93	A_2	498–0	A_2	502–3	A_2	505–8	A_2
$A_1 = 287$		329	A_1	331	A_1	333	A_1	335	A_2	345	A_1	347	A_1A_2	349	A_1A_2	356–58	A_1	359	A_2	361	A_1		
363	$A_1A_2A_1A_2^2$			364–66	A_1	367	A_2	372–74	A_1	375	A_2	377	A_1A_2	379	A_2	380	A_1	381	A_1A_2	382	A_2	402–3	A_1
406–7	A_1	410	A_1	411	A_1A_2	414	$A_1^3A_2^2$	420–23	A_1	428–30	A_1	431	A_2	434–39	A_1	442	A_2	444–46	A_2	457	A_1	459	A_1A_2
461	A_2	463	A_2	466	A_1	467	$A_1^3A_2$	470	A_1	471	A_1A_2	473	A_1A_2	474	$A_1^3A_2$	475	A_1A_2	477–78	A_2	484	A_1	485–87	A_2
489	A_1A_2	491	$A_1A_2^2$	492–93	A_2	498–0	A_2	502–3	A_2	505	A_1A_2	506–9	A_2	**$A_1 = 309$**		322–323	A_1A_2			326	$A_1A_2^2$	327	A_2
330	A_1A_2	331	$A_1A_2^2$	334–35	A_2	338	A_1A_2	339	$A_1A_2A_1A_2^2$			342	$A_1A_2A_1A_2^3$			343	A_2	346	$A_1A_2A_1A_2^3$			354	A_1A_2
355	$A_1A_2^2$	358–59	A_2	362	$A_1A_2^2$	367	A_2	370	A_2	378–79	A_2	382	A_2	448–452	A_1A_2			453	A_2	454	A_1A_2	455	A_2
457–460	A_1A_2			461–63	A_2	465	A_1A_2	467–468	A_1A_2			469	A_2	470	A_1A_2	471	$A_1A_2^2$	475	$A_1A_2^2$	476–79	A_2	485–87	A_2
493	A_2	**$A_1 = 311$**		320	$A_1^3A_2$	321	$A_1^3A_2^2$	322	$A_1^3A_2$	323	$A_1^2A_2^2$	324	$A_1^3A_2$	325	A_2	326	$A_1^2A_2$	327	A_2	328–330	$A_1^2A_2$		
331	A_1A_2	332	$A_1^2A_2$	333	A_2	334	A_1A_2	335	A_2	336	$A_1^2A_2$	337	$A_1^2A_2A_1A_2$			338	$A_1^2A_2$	339	A_1A_2	340	$A_1^2A_2$	341	A_2
342	A_1A_2	343	A_2	344	$A_1^2A_2$	345–350	A_1A_2			352	$A_1^3A_2$	353	$A_1^2A_2^2$	354	$A_1^2A_2$	355	$A_1A_2^2$	356	$A_1^2A_2$	357–59	A_2	360	$A_1^2A_2$
361–362	A_1A_2			363	$A_1A_2^2$	364	$A_1^2A_2$	365–67	A_2	368	$A_1^2A_2$	369–370	A_1A_2			371	$A_1A_2^2$	372	A_1A_2	373–74	A_2		
376–378	A_1A_2			379	A_2	380–381	A_1A_2			382	A_2	392	$A_1^2A_2A_1A_2$			393–394	A_1A_2			395	$A_1A_2A_1A_2^2$		
396–398	A_1A_2			399	A_2	408	A_1A_2	409	$A_1A_2A_1A_2A_1A_2^2$					410	$A_1A_2^2$	411	$A_1A_2^3$	412	$A_1A_2A_1A_2^2$			413	$A_1A_2^2$
414–15	A_2	424	A_1A_2	425	$A_1A_2A_1A_2^2$			426	$A_1A_2^2$	427–31	A_2	440	A_2	441	$A_1A_2^3$	442	A_2	444–46	A_2	448–450	$A_1^2A_2$		
451	A_1A_2	452	$A_1^2A_2$	453	A_2	454	A_1A_2	455	A_2	456	$A_1^2A_2$	457–460	A_1A_2			461	A_2	462	A_1A_2	463	A_2		
464–476	A_1A_2			477	A_2	478	A_1A_2	479	A_2	480–482	A_1A_2			483	$A_1A_2^2$	484–87	A_2	488–490	A_1A_2			491	$A_1A_2^2$
492–93	A_2	496–497	A_1A_2			498–0	A_2	502	A_2	504–505	A_1A_2			506–9	A_2	**$A_1 = 319$**		320–26	A_1	327	$A_1^3A_2^2$	328–30	A_1
331	$A_1^2A_2$	332–34	A_1	335	A_2	336–38	A_1	339	$A_1^2A_2$	340–42	A_1	343	A_1A_2	344	A_1	345–346	$A_1^2A_2$			347	A_1A_2	348	A_1
349–350	A_1A_2			351	A_2	352–54	A_1	355	$A_1^4A_2^2$	356–58	A_1	359	A_2	360–62	A_1	363	$A_1^2A_2^2$	364–66	A_1	367	A_2	368–70	A_1
371	A_1A_2	372–74	A_1	375	A_2	376	A_1	377–378	A_1A_2			379	$A_1A_2^2$	380	A_1	381	A_1A_2	382	A_2	448	A_1		
449–450	$A_1^3A_2$			451	$A_1^2A_2$	452	A_1	453–454	$A_1^2A_2$			455	A_1A_2	457–458	$A_1^2A_2$			459	A_1A_2	460	$A_1^2A_2$		
461–462	A_1A_2			463	A_2	465	$A_1^2A_2$	467	A_1A_2	468	$A_1^2A_2$	469–471	A_1A_2			475–478	A_1A_2			479	A_2	484	A_1
485	A_2	486	A_1A_2	487	A_2	493–94	A_2	501	A_2	503	A_2	**$A_1 = 351$**		381	A_1	438–39	A_1	446	A_1	447	A_2	**$A_1 = 371$**	
381	A_1A_2	415	A_2	447	A_2	**$A_1 = 375$**		376–78	A_1	379	A_1A_2	380	A_1	381	$A_1^2A_2$	382	A_1	384–42	A_1	444–45	A_1	446–47	A_2
448–62	A_1	463	A_2	464–70	A_1	471	$A_1^2A_2$	472–74	A_1	475	A_1A_2	476	A_1	477–478	A_1A_2			479	A_2	480–86	A_1	487	A_2
488–90	A_1	491	A_1A_2	492	A_1	493	A_2	496–98	A_1	499	A_1A_2	500	A_1	502	A_2	504	A_1	505	A_1A_2	506–9	A_2	**$A_1 = 381$**	
387	$A_1^3A_2$	391	$A_1^2A_2$	395	$A_1^2A_2$	399	A_1A_2	403	$A_1^2A_2$	407	A_1A_2	411	A_1A_2	415	A_1A_2	423	A_1A_2	427	$A_1^2A_2$	431	A_1A_2	439	A_1A_2
443	A_2	447	A_2	455	A_1A_2	463	A_1A_2	471	A_1A_2	479	A_2	**$A_1 = 383$**		384–78	A_1	479	A_1A_2	480–94	A_1	496–2	A_1	503	A_1A_2
504–6	A_1	507	A_1A_2	508–9	A_1																		

Acknowledgements

Thanks to the anonymous referees which pointed out some technical and mathematical mistakes in the paper.

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