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# A MEMOIR ON THE SYMMETRIC FUNCTIONS OF THE ROOTS OF AN EQUATION.

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THERE are contained in a work, which is not, I think, so generally known as it deserves to be, the "Algebra" of Meyer Hirsch [the work referred to is entitled Sammlung von Beispielen Formeln und Aufgaben aus der Buchstabenrechnung und Algebra, 8vo. Berlin, 1804 (8 ed. 1853), English translation by Ross, 8vo. London, 1827] some very useful tables of the symmetric functions up to the tenth degree of the roots of an equation of any order. It seems desirable to join to these a set of tables, giving reciprocally the expressions of the powers and products of the coefficients in terms of the symmetric functions of the roots. The present memoir contains the two sets of tables, viz. the new tables distinguished by the letter (a), and the tables of Meyer Hirsch distinguished by the letter (b); the memoir contains also some remarks as to the mode of calculation of the new tables, and also as to a peculiar symmetry of the numbers in the tables of each set, a symmetry which, so far as I am aware, has not hitherto been observed, and the existence of which appears to constitute an important theorem in the subject. The theorem in question might, I think, be deduced from a very elegant formula of M. Borchardt (referred to in the sequel), which gives the generating function of any symmetric function of the roots, and contains potentially a method for the calculation of the Tables (b), but which, from the example I have given, would not appear to be a very convenient one for actual calculation.

Suppose in general

$$(1, b, c \dots \sqrt[3]{1}, x)^{\infty} = (1 - \alpha x) (1 - \beta x) (1 - \gamma x) \dots,$$

so that

$$-b = \Sigma \alpha$$
,  $+c = \Sigma \alpha \beta$ ,  $-d = \Sigma \alpha \beta \gamma$ , &c.,

and if in general

$$(pqr...) = \Sigma \alpha^p \beta^q \gamma^r ...,$$

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where as usual the summation extends only to the distinct terms, so that e.g.  $(p^2)$  contains only half as many terms as (pq), and so in all similar cases, then we have

$$-b = (1), +c = (1^2), -d = (1^3), \&c.$$

and the two problems which arise are, first to express any combination  $b^p c^q \dots$  in terms of the symmetric functions  $(l^x m^y \dots)$ , and secondly, or conversely, to express any symmetric function  $(l^x m^y \dots)$  in terms of the combinations  $b^p c^q \dots$ 

It will conduce materially to brevity if  $1^{p}2^{q}...$  be termed the partition belonging to the combination  $b^{p}c^{q}...$ ; and in like manner if  $l^{x}m^{y}...$  be termed the partition belonging to the symmetric function  $(l^{x}m^{y}...)$ , and if the sum of the component numbers of the partition is termed the weight.

Consider now a line of combinations corresponding to a given weight, e.g. the weight 4, this will be

where I have written under each combination the partition which belongs to it, and in like manner a column of symmetric functions of the same weight, viz.

> (4) (column) (31) ( $2^2$ ) ( $21^2$ ) ( $1^4$ ),

where, as the partitions are obtained by simply omitting the ( ), I have not separately written down the partitions.

It is at once obvious that the different combinations of the line will be made up of numerical multiples of the symmetric functions of the column; and conversely, that the symmetric functions of the column will be made up of numerical multiples of the combinations of the line; but this requires a further examination. There are certain restrictions as to the symmetric functions which enter into the expression of the combination, and conversely, as to the combinations which enter into the expression of the symmetric function. The nature of the first restriction is most clearly seen by the following Table:

| Number of<br>Parts.                        | Greatest<br>Part.  | Combinations<br>with their several<br>Partitions.  | Contain Multiples of the<br>Symmetric Functions.     | Greatest Part<br>does not exceed           | Number of<br>Parts not<br>less than |
|--|--|--|--|--|-------------------------------------|
| $\begin{array}{c}1\\2\\2\\3\\4\end{array}$ | $     \begin{array}{c}       4 \\       3 \\       2 \\       2 \\       1     \end{array} $ | $egin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c}1\\2\\2\\3\\4\end{array}$ | $4 \\ 3 \\ 2 \\ 2 \\ 1$             |

Thus, for instance, the combination bd (the partition whereof is 13) contains multiples of the two symmetric functions  $(1^4)$ ,  $(21^2)$  only. The number of parts in the partition 13 is 2, and the greatest part is 3. And in the partitions  $(1^4)$ ,  $(21^2)$  the greatest part is 2, and the number of parts is not less than 3. The reason is obvious: each term of the developed expression of bd must contain at least as many roots as are contained in each term of d, that is 3 roots, and since the coefficients are linear functions in respect to each root, the combination bd cannot contain a power higher than 2 of any root. The reasoning is immediately applied to any other case, and we obtain

First Restriction.—A combination  $b^p c^q \dots$  contains only those symmetric functions  $(l^x m^y \dots)$ , for which the greatest part does not exceed the number of parts in the partition  $1^p 2^q \dots$ , and the number of parts is not less than the greatest part in the same partition.

Consider a partition such as 1<sup>2</sup>2, then replacing each number by a line of units thus,

# 1 1 11,

and summing the columns, we obtain a new partition 31, which may be called the conjugate <sup>1</sup> of 1<sup>2</sup>2. It is easy to see that the expression for the combination  $b^2c$  (for which the partition is 1<sup>2</sup>2) contains with the coefficient unity, the symmetric function (31), the partition whereof is the conjugate of 1<sup>2</sup>2. In fact  $b^2c = (-\Sigma \alpha)^2 (\Sigma \alpha \beta)$ , which obviously contains the term  $+ 1\alpha^3\beta$ , and therefore the symmetric function with its coefficient + 1 (31); and the reasoning is general, or

THEOREM. A combination  $b^q c^q \dots$  contains the symmetric function (partition conjugate to  $1^{p}2^{q}\dots$ ) with the coefficient unity, and sign + or - according as the weight is even or odd.

Imagine the partitions arranged as in the preceding column, viz. first the partition into one part, then the partitions into two parts, then the partitions into three parts, and so on; the partitions into the same number of parts being arranged according to the magnitude of the greatest part (the greatest magnitude first), and in case of equality according to the magnitudes of the next greatest part, and so on (for other examples, see the outside column of any one of the Tables). The order being thus completely defined, we may speak of a partition as being prior or posterior to another. We are now able to state a second restriction as follows.

Second Restriction.—The combination  $b^p c^q \dots$  contains only those symmetric functions which are of the form (partition not prior to the conjugate of  $1^p 2^q \dots$ ).

The terms excluded by the two restrictions are many of them the same, and it might at first sight appear as if the two restrictions were identical; but this is not

<sup>1</sup> The notion of Conjugate Partitions is, I believe, due to Professor Sylvester or Mr Ferrers. [It was due to Mr now Dr Ferrers.]

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so: for instance, for the combination  $bd^2$ , see Table VII (a), the term (41<sup>s</sup>) is excluded by the first restriction, but not by the second; and on the other hand, the term (3<sup>2</sup>1), which is not excluded by the first restriction, is excluded by the second restriction, as containing a partition 3<sup>2</sup>1 prior in order to 32<sup>2</sup>, which is the partition conjugate to 13<sup>2</sup>, the partition of  $bd^2$ . It is easy to see why  $bd^2$  does not contain the symmetric function (3<sup>2</sup>1); in fact, a term of (3<sup>2</sup>1) is ( $\alpha^3\beta^3\gamma$ ), which is obviously not a term of  $bd^3 = (-\Sigma\alpha)(\Sigma\alpha\beta\gamma)^2$ ; but I have not investigated the general proof.

I proceed to explain the construction of the Tables (a). The outside column contains the symmetric functions arranged in the order before explained; the outside or top line contains the combinations of the same weight arranged as follows, viz. the partitions taken in order from right to left are respectively conjugate to the partitions in the outside column, taken in order from top to bottom; in other words, each square of the sinister diagonal corresponds to two partitions which are conjugate to each other. It is to be noticed that the combinations taken in order, from left to right, are not in the order in which they would be obtained by Arbogast's Method of Derivations from an operand  $a^x$ , a being ultimately replaced by unity. The squares above the sinister diagonal are empty (i.e. the coefficients are zero), the greater part of them in virtue of both restrictions, and the remainder in virtue of the second restriction; the empty squares below the sinister diagonal are empty in virtue of the second restriction; but the property was not assumed in the calculation.

The greater part of the numbers in the Tables (a) were calculated, those of each table from the numbers in the next preceding table by the following method, depending on the derivation of the expression for  $b^{p+1}c^q$ ... from the expression for  $b^{p}c^q$ ... Suppose, for example, the column *cd* of Table V(a) is known, and we wish to calculate the column *bcd* of Table VI(a). The process is as follows:

Given

we obtain

|     | 22             | $1 \mid 2$ | $1^{3}   1$ | 5               |    |
|-----|----------------|------------|-------------|-----------------|----|
|     |                | 1          | 3 1         | 0               |    |
| 321 | 2 <sup>3</sup> | 318        | 2212        | 214             | 16 |
| 1   | 3              | 3          | 2<br>6      | $\frac{12}{10}$ | 60 |
| 1   | 3              | 3          | 8           | 22              | 60 |

where the numbers in the last line are the numbers in the column bcd of Table VI (a). The partition  $2^21$ , considered as containing a part zero, gives, when the parts are successively increased by 1, the partitions 321,  $2^3$ ,  $2^21^2$ , in which the indices of the increased part (i.e. the original part plus unity) are 1, 3, 2; these numbers are taken as multipliers of the coefficient 1 of the partition  $2^21$ , and we thus have the new coefficients 1, 3, 2 of the partitions 321,  $2^3$ ,  $2^21^2$ . In like manner the coefficient 3 of

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the partition 21<sup>3</sup> gives the new coefficients 3, 6, 12 of the partitions 31<sup>3</sup>, 2<sup>2</sup>1<sup>2</sup>, 21<sup>4</sup>, and the coefficient 10 of the partition 1<sup>5</sup> gives the new coefficients 10, 60 of the partitions 21<sup>4</sup> and 1<sup>6</sup>, and finally, the last line is obtained by addition. The process in fact amounts to the multiplication separately of each term of cd =

$$1(2^{2}1) + 3(21^{3}) + 10(1^{5})$$

by b = (1). It would perhaps have been proper to employ an analogous rule for the calculation of the combinations  $c^q d^r$ ... not containing b, but instead of doing so I availed myself of the existing Tables (b). But the comparison of the last line of each Table (a) (which as corresponding to a combination  $b^p$  was always calculated independently of the Tables (b)) with such last line as calculated from the corresponding Table (b), seems to afford a complete verification of both the Tables; and my process has in fact enabled me to detect several numerical errors in the Tables (b), as given in the English translation of the work above referred to. It is not desirable, as regards facility of calculation and independently of the want of verification, to calculate either set of Tables (b) are fully and clearly explained in the work referred to, and I have nothing to add upon this subject.

The relation of symmetry, alluded to in the introductory paragraph of the present memoir, exists in each Table of either set, and is as follows: viz. the number in the Table corresponding to any two partitions in the outside column and the outside line respectively, is equal to the number corresponding to the same two partitions in the outside line and the outside column respectively. Or, calling the two partitions P, Q, and writing for shortness, combination (P) for the combination represented by the partition P, and for greater clearness, symmetric function (P) (instead of merely (P)) to denote the symmetric function represented by the partition P, we have the following two theorems, viz.

THEOREM. The coefficient in combination (P) of symmetric function (Q) is equal to the coefficient in combination (Q) of symmetric function (P); and conversely,

THEOREM. The coefficient in symmetric function (P) of combination (Q) is equal to the coefficient in symmetric function (Q) of combination (P).

M. Borchardt's formula, before referred to, is given in the 'Monatsbericht' of the Berlin Academy (March 5, 1885)<sup>1</sup>, and may be thus stated; viz. considering the case of n roots, write

$$(1, b, c, \dots k \mathbb{Y} 1, x)^n = (1 - \alpha x) (1 - \beta x) \dots (1 - \kappa x) = fx,$$

then

$$\Sigma\left(\frac{1}{1-\alpha x} \ \frac{1}{1-\beta y} \dots \frac{1}{1-\kappa u}\right) = \frac{1}{k} (-)^n \frac{fxfy\dots fu}{\Pi(x,y,\dots u)} \ \frac{d}{dx} \ \frac{d}{dy} \dots \frac{d}{du} \ \frac{\Pi(x,y,\dots u)}{fxfy\dots fu}$$

<sup>1</sup> And in Crelle, t. liii. p. 195.—Note added 4th Dec. 1857, A. C.

where  $\Pi$   $(x, y, \dots u)$  denotes the product of the differences of the quantities  $x, y, \dots u$ , and on the left-hand side the summation extends to all the different permutations of  $\alpha, \beta, \dots \kappa$ , or what is the same thing, of  $x, y, \dots u$ .

Suppose for a moment that there are only two roots, so that

$$(1, b, c \mathfrak{A}^1, x)^2 = (1 - \alpha x) (1 - \beta x),$$

then the left-hand side is

$$\frac{1}{(1-\alpha x)(1-\beta y)}+\frac{1}{(1-\alpha y)(1-\beta x)},$$

which is equal to

 $2 + (\alpha + \beta)(x + y) + (\alpha^{2} + \beta^{2})(x^{2} + y^{2}) + 2\alpha\beta xy + (\alpha^{3} + \beta^{3})(x^{3} + y^{3}) + (\alpha^{2}\beta + \alpha\beta^{2})(x^{2}y + xy^{2}) + \&c.,$ and the right-hand side is

$$\frac{1}{c} \cdot \frac{fxfy}{x-y} \frac{d}{dx} \frac{d}{dy} \frac{x-y}{fxfy},$$

which is equal to

$$\frac{1}{c} \quad \frac{fxfy}{x-y} \left\{ \frac{f'xfy - f'yfx + (x-y)f'xf'y}{(fx)^2(fy)^2} \right\}$$

and therefore to

$$\frac{1}{c} \cdot \frac{1}{fxfy} \left\{ \frac{f'xfy - f'yfx}{x - y} + f'xf'y \right\};$$

or substituting for fx, fy their values,

$$\frac{f'xfy - f'yfx}{x - y}$$

becomes equal to

$$2c - b^2 - bc(x + y) - 2c^2xy$$
,

and f'xf'y is equal to

 $b^2 + 2bc (x + y) + 4c^2xy.$ 

The right-hand side is therefore equal to

$$\frac{2+b(x+y)+2cxy}{(1+bx+cx^2)(1+by+cy^2)};$$

and comparing with the value of the left-hand side, we see that this expression may be considered as the generating function of the symmetric functions of  $(\alpha, \beta)$ , viz. the expression in question is developable in a series of the symmetric functions of (x, y), the coefficients being of course functions of b and c, and these coefficients are (to given numerical factors près) the symmetric functions of the roots  $(\alpha, \beta)$ .

And in general it is easy to see that the left-hand side of M. Borchardt's formula is equal to

$$[0] + [1] (1) (1)' + [2] (2) (2)' + [1^2] (1^2) (1^2)' + \&c.,$$

where (1), (2), (1<sup>2</sup>), &c. are the symmetric functions of the roots  $(\alpha, \beta, \dots, \kappa)$ , (1)', (2)', (1<sup>2</sup>)', &c. are the corresponding symmetric functions of  $(x, y, \dots, u)$ , and [0], [1], [2], [1<sup>2</sup>], &c. are mere numerical coefficients; viz. [0] is equal to 1.2.3...n, and [1], [2], [1<sup>2</sup>], &c. are such that the product of one of these factors into the number of terms in the corresponding symmetric function (1), (2), (1<sup>2</sup>), &c. may be equal to 1.2.3...n. The right-hand side of M. Borchardt's formula is therefore, as in the particular case, the generating function of the symmetric functions of the roots  $(\alpha, \beta, \dots, \kappa)$ , and if a convenient expression of such right-hand side could be obtained, we might by means of it express all the symmetric functions of the roots in terms of the coefficients.

#### Tables relating to the Symmetric Functions of the Roots of an Equation.

The outside line of letters contains the combinations (powers and products) of the coefficients, the coefficients being all with the positive sign, and the coefficient of the highest power being unity; thus in the case of a cubic equation the equation is

$$x^{3} + bx^{2} + cx + d = (x - \alpha)(x - \beta)(x - \gamma) = 0.$$

The outside line of numbers is obtained from that of letters merely by writing 1, 2, 3... for b, c, d..., and may be considered simply as a different notation for the combinations. The outside column contains the different symmetric functions in the notation above explained, viz. (1) denotes  $\Sigma \alpha$ , (2) denotes  $\Sigma \alpha^2$ , (1<sup>2</sup>) denotes  $\Sigma \alpha \beta$ , and so on. The Tables (a) are to be read according to the columns; thus Table II (a) means  $b^2 = 1$  (2) + 2 (1)<sup>2</sup>,  $c = (1^2)$ . The Tables (b) are to be read according to the lines; thus Table II (b) means (2) =  $-2c + 1b^3$ , (1<sup>3</sup>) = +1c.

| I (a).   | II (a).   | III (a).   |
|--|---|--|
| $\begin{array}{c c} \  & \frac{1}{b} \\ \hline (1) & -1 \end{array}$ | $\begin{array}{c c} 1 & 2 & 1^{2} \\ c & b^{2} \\ \hline (2) & +1 & +1 \\ \hline (1^{2}) & +1 & +2 \end{array}$ | $ \begin{array}{c c c c c c c c c c c c c c c c c c c $  |
| I (b).   | II ( <i>b</i> ).  | III (b).   |
| $= \frac{1}{b}$ (1) - 1.   | $= \begin{vmatrix} 2 & 1^{2} \\ c & b^{2} \\ \hline -2 & +1 \\ 1^{2} & +1 \end{vmatrix}$                        | $= \begin{vmatrix} 3 \\ d \\ -3 \\ (21) \end{vmatrix} + \begin{vmatrix} 12 \\ bc \\ +3 \\ -1 \end{vmatrix} = \begin{vmatrix} 1^3 \\ b^3 \\ -1 \end{vmatrix}$ |

|          |       | II    | $T(\alpha)$ . |          |       |
|----------|-------|-------|---------------|----------|-------|
|          | 4     | 13    | $2^2$         | $1^{2}2$ | 14    |
|          | e     | bd    | $C^2$         | $b^2c$   | $b^4$ |
| (4)      | 1     |       |               | -7.5-2   | + 1   |
| (31)     |       | in at | ion i         | + 1      | + 4   |
| $(2^2)$  |       | - 1.  | + 1           | + 2      | + 6   |
| $(21^2)$ | 1. 1. | + 1   | +2            | + 5      | + 12  |
| (14)     | + 1   | + 4   | + 6           | + 12     | +24   |
|          |       | -     |               |          | 5     |

|                                |   | IV                         | (b) <b>.</b>   |                    |                       |
|--------------------------------|---|----------------------------|--|--------------------|-----------------------|
| = (4) (31) (32)                | $ \begin{array}{c} 4\\ e\\ \hline -4\\ \hline +4\\ \hline \end{array} $ | $\frac{13}{bd}$ $+ 4$ $-1$ | $\begin{array}{c} 2^2 \\ c^2 \\ \hline + 2 \\ \hline -2 \\ \hline \end{array}$ |                    | $\frac{1^4}{b^4}$ + 1 |
| $(2^2)$<br>$(21^2)$<br>$(1^4)$ | $\frac{+2}{-4}$<br>+1   | $\frac{-2}{+1}$            |  | <u>nan</u><br>da a | eren<br>eren<br>ede   |

V (a).

|                              |                                      |                 |                  | v (a   | ).   |  |   |
|------------------------------|--------------------------------------|-----------------|------------------|--|--|--|---|
| IJ                           | $\begin{vmatrix} 5\\f \end{vmatrix}$ | 14<br>be        | 23<br>cd         | $\begin{vmatrix} 1^2 3 \\ b^2 d \end{vmatrix}$ | $\begin{vmatrix} 12^2 \\ bc^2 \end{vmatrix}$ | $\begin{vmatrix} 1^{3}2 \\ b^{3}c \end{vmatrix}$ | $\begin{array}{c}1^{5}\\b^{5}\end{array}$ |
| (5)<br>(41)<br>(22)          |                                      |                 |                  |  |  | $\frac{-1}{-3}$                                  | $\frac{-1}{-5}$                           |
| (32)<br>$(31^2)$<br>$(2^21)$ |                                      |                 | - 1              | $\frac{-1}{-2}$                                | $\frac{-1}{-2}$<br>-5                        | $\frac{-3}{-7}$<br>-12                           | $\frac{-10}{-20}$                         |
| $(21^3)$<br>$(1^5)$          | - 1                                  | $\frac{-1}{-5}$ | $\frac{-3}{-10}$ | $\frac{-7}{-20}$                               | $\frac{-12}{-30}$                            | $\frac{-27}{-60}$                                | $\frac{-60}{-120}$                        |

|            |                |     | V      | <i>(b)</i> . |  |     |  |
|------------|----------------|-----|--------|--------------|--|-----|--|
|            | $\int_{f}^{5}$ |     |        |              | $\begin{vmatrix} 12^2 \\ bc^2 \end{vmatrix}$ |     | $egin{array}{c c} 1^5 \ b^5 \end{array}$ |
| (5)        | - 5            | + 5 | + 5    | - 5          | - 5  | + 5 | -1                                       |
| (41)       | +5             | -1  | - 5    | + 1          | + 3  | -1  |  |
| (32)       | + 5            | - 5 | + 1    | + 2          | -1   | 3   |  |
| $(31^2)$   |                |     |        | -1           |  |     |  |
| $(2^{2}1)$ | - 5            | + 3 | -1     | 1            |  |     |  |
| $(21^3)$   | + 5            | -1  | Googe. |              | 2000   |     |  |
| $(1^5)$    | -1             |     |        |              |  |     |  |

VI (a).

|            |                                       |                 |          |       |                      |         |                   |     | . ()     | /•    |                      |      |                    |      |              |   |            |   |          |   |
|------------|---------------------------------------|-----------------|----------|-------|----------------------|---------|-------------------|-----|----------|-------|----------------------|------|--------------------|------|--------------|---|------------|---|----------|---|
|            | $\begin{vmatrix} 6\\ g \end{vmatrix}$ | 15<br><i>bf</i> | 24<br>ce |       | $1^{2}4$<br>$b^{2}e$ | 1.1.1.1 | $\frac{3^2}{d^2}$ | 1   | 23<br>cd | 1.000 | $1^{3}3$<br>$b^{3}d$ |      | $2^{3}$<br>$c^{3}$ | 1000 | $c^{2}2^{2}$ |   | 142<br>B4c |   | 16<br>66 | 0 |
| (6)        |                                       |                 | 2.72     |       | 23                   |         |                   |     |          |       |                      |      |                    |      |              |   |            | + | 1        |   |
| (51)       | 9 98                                  | 1 year          | DATE     | not.  | 0                    | 10      | i.ee              |     | nios     |       | ana                  | d.   | 1 8                | 8    | roda         | + | 1          | + | 6        |   |
| (42)       | a                                     | mont            | eton     | - And | and and              | 176     | a.                | 200 |          |       | R. Pros              | Real | head               | +    | 1            | + | 4          | + | 15       |   |
| $(3^2)$    | 3.374                                 |                 | aniti    |       |                      |         |                   | 1   |          | 1000  | Alth                 | +    | 1                  | +    | 2            | + | 6          | + | 20       | - |
| $(41^2)$   |                                       |                 | 0.2.72   |       |                      |         |                   | 1   | -        | +     | 1                    |      |                    | +    | 2            | + | 9          | + | 30       |   |
| (321)      |                                       | 2.91            | 1        |       |                      |         |                   | +   | 1        | +     | 3                    | +    | 3                  | +    | 8            | + | 22         | + | 60       |   |
| $(2^3)$    |                                       |                 |          |       | )                    | +       | 1                 | +   | 3        | +     | 6                    | +    | 6                  | +    | 15           | + | 36         | + | 90       |   |
| $(31^3)$   | 22.0                                  | BOUL            |          | +     | 1                    |         |                   | +   | 3        | +     | 10                   | +    | 6                  | +    | 18           | + | 48         | + | 120      |   |
| $(2^21^2)$ | -                                     |                 | + ]      | +     | 2                    | +       | 2                 | +   | 8        | +     | 18                   | +    | 15                 | +    | 34           | + | 78         | + | 180      | 1 |
| (214)      | 10                                    | + 1             | + 4      | +     | 9                    | +       | 6                 | +   | 22       | +     | 48                   | +    | 36                 | +    | 78           | + | 168        | + | 360      |   |
| (16)       | + 1                                   | + 6             | + 15     | 5 +   | 30                   | +       | 20                | +   | 60       | +     | 120                  | +    | 90                 | +    | 180          | + | 360        | + | 720      |   |

VI (b).

|            |     |     |     |        |       | - /- |        |       |              |           |       |  |
|------------|-----|-----|-----|--------|-------|------|--------|-------|--------------|-----------|-------|--|
|            | 6   | 15  | 24  | 124    | 32    | 123  | 133    | 23    | $1^{2}2^{2}$ | 142       | 16    |  |
| =          | g   | bf  | ce  | $b^2c$ | $d^2$ | bcd  | $b^3d$ | $c^3$ | $b^2c^2$     | $b^4c$    | 66    |  |
| (6)        | - 6 | + 6 | + 6 | - 6    | + 3   | -12  | + 6    | -2    | + 9          | - 6       | +1    |  |
| (51)       | + 6 | -1  | - 6 | + 1    | - 3   | + 7  | -1     | + 2   | 4            | + 1       |       |  |
| (42)       | + 6 | - 6 | + 2 | +2     | - 3   | + 4  | -2     | -2    | + 1          |           |       |  |
| $(3^2)$    | + 3 | - 3 | - 3 | + 3    | + 3   | - 3  |        | +1    |              |           | (0)-1 |  |
| $(41^2)$   | - 6 | + 1 | + 2 | -1     | + 3   | - 3  | + 1    |       |              | The state |       |  |
| (321)      | -12 | + 7 | + 4 | - 3    | - 3   | + 1  |        |       |              |           | 3     |  |
| $(2^3)$    | - 2 | + 2 | -2  |        | + 1   |      | - Cal  |       |              |           |       |  |
| $(31^3)$   | + 6 | -1  | -2  | +1     |       |      | 41     |       |              |           |       |  |
| $(2^21^2)$ | + 9 | - 4 | +1  |        |       |      |        |       |              |           |       |  |
| (214)      | - 6 | + 1 | -   |        |       |      |        |       | 100          |           | 1275  |  |
| (16)       | + 1 |     |     |        |       |      |        |       |              |           |       |  |

# [147

|                                 |                                     |  |          |       |                      |                  |        |                 |           |                                      |   | VII                  | (a).   |                  |   |                      |   |                      |   |                      |   |                              |   |                    |     |                     |
|---------------------------------|-------------------------------------|--|----------|-------|----------------------|------------------|--------|-----------------|-----------|--------------------------------------|---|----------------------|--|------------------|---|----------------------|---|----------------------|---|----------------------|---|------------------------------|---|--------------------|-----|---------------------|
| II                              | $\begin{array}{c} 7\\ h\end{array}$ | $\begin{vmatrix} 16\\bg \end{vmatrix}$ | 25<br>cf |       | ${1^{2}5} \\ b^{2}f$ | 34<br>de         | 101111 | 24<br>oce       | 1 12 1 12 | 1 <sup>3</sup> 4<br>5 <sup>3</sup> e |   | $12^{2}$<br>$bd^{2}$ | and the second s | $2^23$<br>$c^2d$ |   | $^{2}23$<br>$^{2}cd$ | 1 | $1^{4}3$<br>$b^{4}d$ | 1 | $12^{3}$<br>$5c^{3}$ |   | $1^{3}2^{2}$<br>$b^{3}c^{2}$ |   | 152<br>55c         | 10  |                     |
| (7)<br>(61)                     |                                     |  |          | _     |                      |                  |        | 1               |           |                                      |   |                      |  |                  |   |                      |   |                      |   |                      |   |                              |   | 1                  | -   | 1 7                 |
| (52)                            |                                     |  |          | _     |                      |                  |        | 1.2.            |           |                                      |   |                      |  |                  |   |                      |   |                      |   |                      | - | 1                            | - | 5                  | 1-  | 21                  |
| $(43)$ $(51^2)$                 |                                     |  |          |       |                      |                  |        | 15              |           | -                                    | - |                      |  |                  |   |                      | - | 1                    | - | 1                    | - | $\frac{3}{2}$                | - | $\frac{10}{11}$    | 1   | $\frac{35}{42}$     |
| (421)                           |                                     | 14.00%                                 |          |       |                      | 9.4              |        |                 |           |                                      |   |                      |  |                  | - | 1                    | - | 4                    | - | 3                    | - | 11                           | - | 35                 | -   | 105                 |
| $(3^{2}1)$<br>$(32^{2})$        |                                     | 1.1.62                                 |          |       |                      |                  |        |                 | -         |                                      | - | 1                    | -  | $\frac{1}{2}$    | - | $\frac{2}{5}$        | - | $\frac{6}{12}$       | - | $\frac{7}{12}$       |   | $\frac{18}{31}$              | - | 50<br>80           |     | $\frac{140}{210}$   |
| $(41^3)$                        |                                     |  |          |       |                      |                  |        | 1               | -         | 1                                    |   |                      | -  |                  | - | 3                    | - | 13                   | _ | 6                    | - | 24                           | - | 75                 | 170 | 210                 |
| $(321^2)$<br>(2 <sup>3</sup> 1) |                                     | 1.3.1.2                                |          |       | · · ·                | - 1              | -      | $\frac{1}{3}$   |           | 36                                   | - | $\frac{2}{7}$        |  | 5<br>-12         | - | $\frac{13}{27}$      | - | $\frac{34}{60}$      | - | $\frac{27}{51}$      |   | $\frac{68}{117}$             | - | $\frac{170}{270}$  | -   | $\frac{420}{630}$   |
| (314)                           |                                     |  |          | 1     | - 1                  |                  | -      |                 | -         | 13                                   | - | 6                    | _  |                  | _ |                      | - | 88                   |   | 60                   | - | 150                          | - | 360                | -   | 840                 |
| $(2^21^3)$<br>$(21^5)$          |                                     | -1                                     |          | 3.1.1 | $\frac{-2}{-11}$     | $\frac{-3}{-10}$ | -      | $\frac{11}{35}$ | 1         | 24<br>75                             | + | $\frac{18}{50}$      | -  | $\frac{31}{80}$  |   | $\frac{68}{170}$     |   | $\frac{150}{360}$    |   | $\frac{117}{270}$    |   | $\frac{258}{570}$            | - | $\frac{570}{1200}$ |     | $\frac{1260}{2520}$ |
| (17)                            | - 1                                 | -7                                     | -2       | 1     | - 42                 | - 35             | -      | 105             | 1-        | 210                                  | - | 140                  | -  | 210              | - | 420                  | - | 840                  | - | 630                  | - | 1260                         | - | 2520               | -   | 5040                |

VII (b).

|            | 7    | 16  | 25  | 125         | 34  | 124   | 134    | $ 12^2$ | 223    | 1223      | 143    | $12^{3}$ | $1^{3}2^{2}$ | 152    | 17        |
|------------|------|-----|-----|-------------|-----|-------|--------|---------|--------|-----------|--------|----------|--------------|--------|-----------|
| =          | h    | bg  | cf  | $b^2 f$     | de  | bce   | $b^3e$ | $bd^2$  | $c^2d$ | $b^2cd$   | $b^4d$ | $bc^3$   | $b^{3}c^{2}$ | $b^5c$ | 67        |
| (7)        | - 7  | + 7 | + 7 | -7          | + 7 | - 14  | + 7    | - 7     | -7     | + 21      | -7     | + 7      | - 14         | + 7    | - 1       |
| (61)       | + 7  | -1  | -7  | + 1         | - 7 | + 8   | -1     | + 4     | + 7    | - 9       | + 1    | - 5      | + 5          | -1     |           |
| (52)       | + 7  | -7  | + 3 | + 2         | - 7 | + 4   | -2     | + 7     | - 3    | - 6       | + 2    | + 3      | - 1          |        |           |
| (43)       | + 7  | -7  | - 7 | + 7         | + 5 | + 2   | - 3    | - 5     | + 1    | + 3       |        | - 1      |              |        |           |
| $(51^2)$   | - 7  | +1  | + 2 | -1          | + 7 | - 3   | + 1    | - 4     | -2     | + 4       | - 1    |          |              |        |           |
| (421)      | -14  | + 8 | + 4 | - 3         | + 2 | - 8   | + 3    | + 1     | + 2    | - 1       |        |          |              |        |           |
| $(3^{2}1)$ | - 7  | + 4 | + 7 | - 4         | - 5 | + 1   |        | + 2     | - 1    | - Andrews |        |          |              |        |           |
| $(32^2)$   | - 7  | + 7 | - 3 | -2          | + 1 | + 2   |        | - 1     |        |           |        |          |              |        |           |
| $(41^3)$   | + 7  | -1  | -2  | + 1         | - 3 | + 3   | -1     |         |        |           |        |          |              |        |           |
| $(321^2)$  | + 21 | - 9 | - 6 | + 4         | + 3 | - 1   |        |         | V9     |           |        |          |              |        |           |
| $(2^{3}1)$ | + 7  | - 5 | + 3 |             | - 1 | Pulle |        |         | 0.0    |           |        |          |              |        | 1 1 1 2 1 |
| $(31^{4})$ | - 7  | + 1 | + 2 | -1          |     |       |        |         | -      |           |        | 1        |              |        |           |
| $(2^21^3)$ | - 14 | + 5 | -1  |             |     |       |        |         |        |           |        |          |              |        |           |
| $(21^5)$   | + 7  | -1  |     | Served in _ | 2   |       |        |         |        |           |        |          |              |        |           |
| (17)       | - 1  |     |     | 103         |     |       |        |         |        |           |        |          |              |        |           |

425

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| 8  | 1  | 17   | 2   | 6 1   | 126  | 1 9   | 35   | 125   | 5 1      | 135   | 1       | 42 1   | 134  | 1 2   | <sup>2</sup> 4  | 1224   | .     | 144   | 2:              |
|--|--|--|---|---|--|---|--|---|----------|---|---------|--|--|---|---|--|-------|---|-----------------|
| i  |  | bh   | 1   | $\frac{1}{g}$   | $b^2g$   |   | lf   | bcf   |          | $b^3f$  |         | $e^2$  | bde  |   | т<br>2е   | $b^2 ce$   |       | $b^4e$  | ca              |
| -  | -   -  |  |   | 9   | 0 9  |   | 9  |   |          |   | -       |  |  |   |   |  |       |   |                 |
| Res.   |  |  | -   |   | -  |   |  |   | -        | 1 2011  |         |  | 1 1 2  |   |   | 1210   |       |   |                 |
| 140  | - -  | 1  |   |   |  |   |  | -   | -        |   |         |  |  |   | 2   |  |       |   |                 |
| -  | - -  | -  |   |   | -  |   |  |   | -        |   |         |  |  |   |   |  |       |   |                 |
| -  |  |  |   |   |  |   |  |   | -        |   |         |  |  |   |   |  |       |   |                 |
|  |  | 1.9  | -   |   |  |   | -  | -   | -        |   |         |  |  | _   |   |  |       |   |                 |
| 1  |  | -  |   |   |  |   |  |   |          | -   | -       |  |  |   |   |  |       |   |                 |
|  |  |  |   |   | 4.4  |   | _  | -   |          |   |         |  | 1.11   | _   |   |  |       |   |                 |
| 1  |  | 1  |   |   | -  |   |  |   | _        | 2+  |         |  |  | _   |   | 2413   |       | 191923  | -               |
|  |  | -  |   |   | 17.1   | 2   | -  |   |          | 15.   |         |  | 11.1   |   |   | 14 14  |       | 1.1 1   |                 |
|  |  | 1  |   |   |  | _   |  | -   |          |   |         |  |  | _   | 1   |  |       |   | +               |
| - And  | _  |  |   |   |  |   |  |   |          |   | _       |  |  | -   | 1   |  |       |   |                 |
|  |  |  |   |   |  |   |  |   |          | 12  |         |  |  |   |   |  | 1 +   |   |                 |
|  |  |  |   |   |  |   |  |   |          | 1 2 2   |         |  |  | +   | 1   | Constant Sociale   |       | + 6   | +               |
|  |  | 185  |   |   |  |   | 1  |   | 21       | 144.85  |         |  |  | 1 +   | 2   | 1 1  |       | + 12  | +               |
|  | 1  |  |   | 0.5   |  |   |  |   | 1        | Riod  | +       | 1  | + ·  | 4 +   | 6   | + 1  |       |   | +               |
|  |  |  |   |   |  |   | 101  |   |          | + 1   |         |  |  |   | •••   |  | 4 -   |   |                 |
|  |  |  | 1 Ve  |   |  |   |  | +   | 1        | + 3   |         |  | +  | 3 +   | 7   | + 1  |       |   | +               |
|  |  |  |   |   | 10.0   | +   | 1  | +   | 3        | + 6   | +       | 2  | + 1  | 1 +   | 18  | + 3  |       | + 84  | +               |
|  |  |  |   |   | +  | 1   |  | +   | 5        | + 16  |         |  | + 1  | 0 +   | 20  | + 5  |       | + 140   | +               |
| 2  |  |  | -   | 7   | +  | 2 +   | 4  | +   | 14       | + 30  | +       | 6  | + 3  | 2 +   | 53  | + 11   |       | + 246   | +               |
|  |  |  | +   | 1   | T  | - 1 '   |  |   |          |   |         |  | 0  | ~   | 150   | 01   |       |   |                 |
|  |  | + 1  | +++   | 6   |  |   | 15   | + 1   | 51       | +108  | +       | 20   | + 9  | +   c   | 150   | + 31   |       | + 660   | + 2             |
|  | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | 3<br>6<br>+<br>*23  | 15<br>56   | + 10  | 51<br>68 | +108<br>+ 336<br>$2^4$  | +       | 70   | + 28   | 0 + 4   | 420   | + 84<br>1 <sup>6</sup> 2   |       | + 1680<br>1 <sup>8</sup>  | $\frac{+2}{+5}$ |
| 15   | 1-   | + 8  | +++   | 6<br>28   | +1<br>+ 5  | $\frac{3}{6}$ +   | 15<br>56   | + 10  |          | + 336   | +       | 70   | + 28   | 0 + 4   |   | + 84   | 0   - | + 1680<br>$\frac{1^8}{b^8}$   |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | 3<br>6<br>+<br>*23  | 15<br>56   | + 10  |          | + 336   | +       | 70   | + 28   | 0 + 4   | 420   | $\frac{1^{6}2}{b^{6}c}$  | 0   - | $+ 1680$ $\frac{1^8}{b^8}$ 1  |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | 3<br>6<br>+<br>*23  | 15<br>56   | + 10  |          | + 336   | +       | 70   | + 28   | $0 + 42^{2}$<br>$4c^{2}$  | 420   | $\frac{1^{6}2}{b^{6}c}$  | 0   - | $   \begin{array}{r} + 1680 \\             1^8 \\             b^8 \\             \hline             1 \\           $  |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | 3<br>6<br>+<br>*23  | 15<br>56   | + 10  |          | + 336   |         | 70   | + 28 $  1$ $b$ $+$                                   | $0 + 42^{2}$<br>$42^{2}$<br>$4c^{2}$<br>1   | 420   | $\frac{1^{6}2}{b^{6}c}$  | 0   - | $+ 1680$ $1^{8}$ $b^{8}$ $1$ $1$ $8$ $28$   |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | 3<br>6<br>+<br>*23  | 15<br>56   | + 10  | 68       | $+ 336$ $2^4$ $c^4$   |         | 70<br>223<br>223<br>223<br>223<br>1  | + 28 $1$ $b$ $+$ $+$ $+$                             | $\begin{array}{r} 0 \\ + \\ 42^2 \\ 4c^2 \\ \hline \\ 1 \\ 4 \\ \end{array}$  | 420<br>   | $162 \\ b^{6}c$ 1 6 1 5  | 0   - | $+ 1680$ $1^{8}$ $b^{8}$ $1$ $1$ $8$ $28$ $56$  |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+ 5  | $\frac{3}{6} + \frac{+}{+}$   |  | 1 <sup>5</sup> 3<br>b <sup>5</sup> d  | 68       | $+ 336$ $2^{4}$ $c^{4}$ 1   |         | $\begin{array}{c c} 7 & 0 \\ \hline 2 & 2^3 \\ 2^2 & 2^3 \\ \hline 1 \\ \hline 2 \\ 1 \\ 2 \end{array}$  | + 28 $+ 28$ $+$ $+$ $+$ $+$                          | $0 + 42^{2}$<br>$4c^{2}$<br>1<br>$4c^{2}$   | 420<br>+<br>+<br>+<br>+<br>+  | + 84<br>$1^{6}2$<br>$b^{6}c$<br>1<br>6<br>15<br>20   |       |   |                 |
| 15   | 232  | + 8  | +++   | 6<br>28<br>2 <sup>2</sup> 3   | +1<br>+5   | $\frac{3}{6}$ + + + + + $\frac{323}{^3cd}$  |  | +10<br>$1^{53}$<br>$b^{5}d$<br>1  | 68       | $+ 336$ $2^4$ $c^4$ 1   |         | $\begin{array}{c c} 7 & 0 \\ \hline 2 & 2^3 \\ \hline 2 & 2^3 \\ \hline 2 & 2^3 \\ \hline 1 \\ \hline 1 \\ 2 \\ \cdots \end{array}$  | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$                     | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 420<br>+<br>+<br>+<br>+<br>+  | + 84<br>$1^{62}$<br>$b^{6c}$<br>1<br>6<br>15<br>200<br>13  |       | $     + 1680     18     b^8 1 1 8 28 56 70 56 $   |                 |
| 15   | 232  | + 8  | +<br>+<br>+<br>bc   | $\begin{array}{c c} 6 \\ 28 \\ 2^23 \\ d^2d \end{array}$  | +1<br>+ 5  | $\frac{3}{6}$ + + + + + $\frac{323}{^3cd}$  |  | +10<br>$1^{53}$<br>$b^{5}d$<br>1<br>1<br>5  | 68       | + 336<br>2 <sup>4</sup><br>c <sup>4</sup>   |         | $\begin{array}{c c} 7 & 0 \\ \hline 2 & 2 & 3 \\ \hline 1 & 2 & 3 \\ \hline 1 & 2 & 3 \\ \hline 3 & 3 & 3 \\ \hline \end{array}$   | + 28 $+ 28$ $+$ $+$ $+$ $+$ $+$ $+$ $+$              | $ \begin{array}{r} 0 + 4 \\ 42^{2} \\ 4c^{2} \\ \hline 1 \\ 4c^{2} \\ \hline 1 \\ 4 \\ 6 \\ 2 \\ \hline 14 \end{array} $  | 420<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+   | + 84<br>$1^{62}$<br>$b^{6c}$<br>1<br>6<br>15<br>200<br>13<br>51  |       | $     + 1680     18     b^8 11 8 288 566 700 566 168 $  |                 |
| 1 <sup>s</sup><br>b <sup>2</sup>   | 232  | + 8  | +<br>+<br>bc  |   | + 1<br>+ 5<br>   | $\frac{3}{6} + \frac{3}{6}$   |  | +10<br>$1^{5}3$<br>$b^{5}d$<br>1<br>1<br>5<br>10  |          | $+ 336$ $2^4$ $c^4$ $1$ $$ $$ $4$   | +++++++ | $\begin{array}{c c} 7 & 0 \\ \hline 2 & 2 & 3 \\ 2 & 2 & 3 \\ \hline 2 & 2 & 3 \\ \hline 2 & 2 & 3 \\ \hline 1 & 2 & 3 \\ \hline 1 & 2 & 3 \\ \hline 1 & 3 & 11 \end{array}$   | + 28 $+ 28$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$  | $ \begin{array}{r} 0 + 4 \\ 42^{2} \\ 4c^{2} \\ \hline 1 \\ 4c^{2} \\ \hline 1 \\ 4 \\ 6 \\ 2 \\ \hline 14 \\ 32 \end{array} $  | 420<br>++<br>+<br>+<br>+<br>+<br>+<br>+<br>+  | + 84<br>$1^{62}$<br>$b^{6c}$<br>1<br>6<br>15<br>200<br>13<br>51<br>95  | 0     | $     + 1680     18     b^8 1 8 28 56 70 56 168 280 $   |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup>  | 232<br>2d2   | + 8  | ++++++++  | $\frac{6}{28}$<br>$2^{2^3} - 2^{$ | +11<br>+5  | $\frac{3}{6} + \frac{3}{6} + \frac{3}{23}$  |  | +10<br>$1^{53}$<br>$b^{5d}$<br>10<br>20   |          | $+ 336$ $2^4$ $c^4$ $1$ $$ $$ $4$ $6$   |         | $ \begin{array}{c c} 7 & 0 \\ 2 & 2 & 3 \\ 2 & 2 & 3 \\ \hline 2 & 2 & 3 \\ \hline 1 & 2 \\ \hline 1 & 2 \\ \hline 1 & 2 \\ \hline 1 & 1 \\ 1 & 1 \\ 1 & 8 \\ \end{array} $  | + 28 $+ 28$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$  | $ \begin{array}{c} 0 + 4 \\ 42^{2} \\ 4c^{2} \\ \hline 1 \\ 4c^{2} \\ \hline 5 \\ 3c^{2} \\ \hline 5 \\ 3c^{2} \\ \hline 5 \\ 3c^{2} \\ \hline 5c^{2} \\ $ | 420   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>1<br>6<br>15<br>200<br>13<br>51<br>95<br>150  |       | $     + 1680     18     b^8     1     1     8     28     56     70     56     168     280     420     420 $   |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup>  | 232<br>2d2   | + 8  | ++++++++++++++++++++++++++++++++++++++  | $\begin{array}{c c}\hline 6\\ 28\\ 2^{2}3\\ 2^{2}d\\ \hline \\ \hline \\ 1\\ 2\\ 5\\ \hline \end{array}$  | +1<br>+5   | $\frac{3}{6}$ + + + + + + + + + + + + + + + + + + +   |  | +10<br>$1^{53}$<br>$b^{5}d$<br>10<br>20<br>30   |          | $+ 336$ $2^4$ $c^4$ $1$ $1$ $$ $$ $4$ $6$ $12$  |         | $ \begin{array}{c c} 7 & 0 \\ 2 & 2^3 \\ 2 & 2^3 \\ \hline 1 \\ 2 \\ \hline 1 \\ 2 \\ \hline 1 \\ 1 \\ 3 \\ \hline 1 \\ 1 \\ 8 \\ 3 \\ 1 \end{array} $   | + 28 $+ 28$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$  | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}$<br>$b^{6c}$<br>1<br>6<br>15<br>200<br>133<br>51<br>95<br>150<br>210   |       | + 1680     + 1680     + 1680     + 1680     + 168     + 168     + 28     + 56 |                 |
| 1 <sup>s</sup><br>b <sup>2</sup>   | 232<br>2d <sup>2</sup>   | + 8  | +++++++   | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$  | +11<br>+5  | $\frac{3}{6}$ + + + $\frac{3}{23}$ + + + $\frac{3}{3}$ + 23 + $\frac{3}{3}$ + $\frac{3}{3}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{3}{12}$ + $\frac{3}{3}$ + $\frac{3}{12}$ + $\frac{3}{3}$ + $\frac{3}{12}$ + $\frac{3}{3}$ + $\frac{3}{12}$ +  |  | +10<br>$1^{53}b^{5}d$<br>10<br>200<br>300<br>16   |          | $+ 336$ $2^4$ $c^4$ $1$ $$ $$ $4$ $6$ $12$ $$   |         | $ \begin{array}{c c} 7 & 0 \\ \hline 2 & 2^3 \\ 2^2 & 2^3 \\ \hline 1 \\ 2 \\ \hline 1 \\ 2 \\ \hline 1 \\ 1 \\ 3 \\ 1 \\ 1 \\ 1 \\ 8 \\ \hline 3 \\ 1 \\ 6 \\ \end{array} $   | + 28 $+ 28$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$  | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>6<br>15<br>200<br>13<br>51<br>95<br>150<br>210<br>108   |       | $     + 1680     18     b^8     1     1     8     28     28     56     70     566     168     280     420     560     336     3 $   |                 |
| 1 <sup>s</sup><br><i>b</i> <sup>2</sup>  | 232<br>2d2   | + 8  | ++++++++++++++++++++++++++++++++++++++  | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$  | + 1<br>+ 5<br>   | $\frac{3}{6}$ + + + $\frac{3}{6}$ + + + $\frac{3}{23}$ + $\frac{3}{3}$ cd   |  | +10<br>$1^{53}b^{5}d$<br>10<br>200<br>300<br>16<br>55   |          | + 336<br>$2^4 c^4$<br>  |         | 70<br><sup>2</sup> 2 <sup>3</sup><br><sup>2</sup> 2 <sup>3</sup><br><sup>2</sup> 2 <sup>3</sup><br>1<br>2<br>2<br><br>3<br>11<br>18<br>31<br>6<br>39   | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>6<br>15<br>200<br>13<br>51<br>95<br>150<br>210<br>108<br>315  |       | + 1680     18     18     8     1     28     28     28     56     70     56     168     280     420     560     336     840  |                 |
| 1 <sup>s</sup><br><i>b</i> <sup>2</sup><br>+.<br>+.<br>+.  | 232<br>2d2   | + 8  | +<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+                               | $\begin{array}{c c}\hline 6\\ 28\\ 2^{2^3}\\ 2^{2^3}\\ 2^2d\\ \hline \\ \hline \\ 1\\ 2\\ 5\\ \hline \\ 5\\ 12\\ \end{array}$   | +1<br>+5<br>   | $\frac{3}{6}$ + + $\frac{3}{23}$ + + $\frac{3}{23}$ + $\frac{3}{2}$ + $\frac{3}{2}$ + $\frac{3}{2}$ + $\frac{3}{2}$ + $\frac{1}{3}$ + $\frac{3}{7}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{1}{18}$ + $\frac{3}{30}$ + $\frac{3}{2}$  | 15<br>56<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+   | +10<br>$1^{53}b^{5}d$<br>10<br>200<br>300<br>16<br>555<br>80  |          | $+ 336$ $2^4$ $c^4$ $1$ $1$ $$ $$ $4$ $6$ $12$ $$ $12$ $28$   |         | $\begin{array}{c c} 7 & 0 \\ \hline \\ 223 \\ 2c^3 \\ \hline \\ 2c^3 \\ \hline \\ 1 \\ 2 \\ 2c^3 \\ \hline \\ 1 \\ 2 \\ \hline \\ 3 \\ 11 \\ 18 \\ 31 \\ \hline \\ 6 \\ 39 \\ 68 \\ \hline \\ 68 \\ \hline \end{array}$  | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $\begin{array}{c c} 0 & + & \\ & 42^2 \\ & 4c^2 \\ \hline \\ 1 \\ 4 \\ 4c^2 \\ \hline \\ 1 \\ 4 \\ 6 \\ 2 \\ 14 \\ 32 \\ 53 \\ 80 \\ \hline \\ 30 \\ 114 \\ 172 \\ \end{array}$   | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>6<br>15<br>200<br>13<br>51<br>95<br>150<br>210<br>108<br>315<br>440   |       | + 1680     18     18     8     1     1     8     28     28     56     70     56     168     280     420     560     336     840     1120     1120   |                 |
| 1 <sup>s</sup><br><i>b</i> <sup>2</sup><br>+<br>+<br>+<br>+<br>+<br>+                                    | 232<br>232<br>232<br>232<br>232<br>232<br>232<br>232<br>232<br>232               | + 8  | ++++++++++++++++++++++++++++++++++++++  | $     \begin{array}{ c c c c c }     \hline             6 \\             28 \\             223 \\             223 \\           $  | +1<br>+5<br>   | $\frac{3}{6}$ + + $\frac{3}{23}$ + + $\frac{3}{23}$ + $\frac{3}{2}$ +   | 15<br>56<br>++++++++++++++++++++++++++++++++++   | +10<br>$1^{53}b^{5}d$<br>10<br>20<br>30<br>16<br>55<br>80<br>140  |          | $+ 336$ $2^4$ $c^4$ $1$ $1$ $$ $$ $4$ $6$ $12$ $$ $12$ $28$ $48$  |         | $\begin{array}{c c} 7 & 0 \\ \hline \\ 223 \\ 2c^3 \\ 2c^3 \\ \hline \\ 1 \\ 2 \\ 2c^3 \\ \hline \\ 12 \\ 2 \\ 31 \\ \hline \\ 118 \\ 31 \\ \hline \\ 6 \\ 39 \\ 68 \\ 117 \\ \hline \end{array}$  | + 28 $1 b$ $+ +$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $\begin{array}{c c} 0 & + & \\ & 42^2 \\ & 4c^2 \\ \hline \\ 1 \\ & 4 \\ & 6 \\ \hline \\ 2 \\ & 14 \\ \hline \\ 32 \\ & 53 \\ & 80 \\ \hline \\ 30 \\ & 114 \\ \hline \\ 172 \\ & 284 \\ \end{array}$  | 420   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>6<br>15<br>20<br>13<br>51<br>95<br>150<br>210<br>108<br>315<br>440<br>690   |       | $\begin{array}{r} + 1680 \\ 1^8 \\ b^8 \\ \hline 1 \\ 8 \\ 288 \\ 566 \\ 700 \\ 566 \\ 168 \\ 280 \\ 420 \\ 560 \\ 336 \\ 840 \\ 1120 \\ 1680 \\ \end{array}$   |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup><br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+                     | $\frac{1}{2}$  | +8   | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} 6 \\ 28 \\ 2^{2^{3}} \\ 2^{2^{3}} \\ ^{2^{2}} \\ d \\ \hline 1 \\ 2 \\ 5 \\ 12 \\ 24 \\ 48 \\ \end{array} $  | +1<br>+5<br>   | $\frac{3}{6}$ + + $\frac{3}{23}$ + + $\frac{3}{6}$ + + $\frac{3}{23}$ + $\frac{3}{3}$ + $\frac{3}{3}$ + $\frac{1}{12}$ + $\frac{3}{12}$ + $\frac{3}{18}$ + $\frac{3}{108}$ + $\frac{3}{108}$ + $\frac{1}{108}$ + \frac{1}{108} + \frac{1}{108} + \frac{1}{108}  |  | +10<br>$1^{53}b^{5}d$<br>10<br>20<br>30<br>16<br>55<br>80<br>140<br>240   |          | $ \begin{array}{r} + 336 \\ 2^{4} \\ c^{4} \\ \hline \\ \hline \\ 1 \\ \\ \hline \\ 12 \\ \hline \\ 28 \\ 48 \\ 90 \\ \hline \end{array} $                          |         | $\begin{array}{c c} 7 & 0 \\ \hline & & \\$ | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $\begin{array}{c c} 0 & + & \\ & & \\$   | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>6<br>15<br>20<br>13<br>51<br>95<br>150<br>210<br>108<br>315<br>440<br>690<br>1080   |       | $\begin{array}{r} + 1680 \\ \hline 18 \\ b^8 \\ \hline 1 \\ 8 \\ \hline 28 \\ 56 \\ \hline 70 \\ 56 \\ \hline 168 \\ 280 \\ 420 \\ 560 \\ \hline 336 \\ \hline 840 \\ 1120 \\ \hline 1680 \\ 2520 \\ \end{array}$   |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup>  | 232<br>2d <sup>2</sup>   | +8<br>-1<br>-1<br>-1<br>-1<br>-1<br>-1<br>-1<br>-1 | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} 6 \\ 28 \\ 2^{2^3} \\ ^2 d \\ \hline 1 \\ 2 \\ 5 \\ 5 \\ 12 \\ 24 \\ 48 \\ 12 \\ \end{array} $   | $\begin{array}{c} + 1 \\ + 5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ + \\ + \\ +$      | $\frac{3}{6}$ + $\frac{3}{6}$ + $\frac{3}{6}$ + $\frac{3}{6}$ + $\frac{3}{6}$ - $\frac{3}{6}$ - $\frac{1}{1}$ - $\frac{1}{3}$ - $\frac{3}{18}$ - $\frac{3}{108}$ - $\frac{3}{108}$ - $\frac{1}{108}$ - $1$  | 15<br>56<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+ | +10<br>$1^{53}$<br>$b^{5}d$<br>10<br>200<br>300<br>16<br>555<br>800<br>1400<br>2400<br>1400                                     |          | $ \begin{array}{r} + 336 \\ 2^{4} \\ c^{4} \\ \hline \\ 1 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$  |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2^2 \\ c^3 \\ \hline \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 8 \\ 31 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ \end{array}$   | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $\begin{array}{c c} 0 & + & \\ & & \\$   | +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +   | + 84<br>$1^{62}$<br>$b^{6}c$<br>1<br>1<br>6<br>15<br>200<br>13<br>51<br>95<br>150<br>210<br>108<br>315<br>440<br>690<br>1080<br>660  |       | $\begin{array}{r} + 1680 \\ \hline 18 \\ b^8 \\ \hline 1 \\ 8 \\ \hline 28 \\ \hline 28 \\ \hline 56 \\ \hline 70 \\ \hline 56 \\ \hline 168 \\ 280 \\ \hline 420 \\ \hline 560 \\ \hline 336 \\ \hline 840 \\ \hline 1120 \\ \hline 1680 \\ \hline 2520 \\ \hline 1680 \\ \hline \end{array}$  |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup><br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+                     | 232<br>2d <sup>2</sup><br><br>1<br>2<br>3  | +8   | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} 6 \\ 28 \\ 2^{2^3} \\ 2^2 \\ d \\ \hline 1 \\ 2^2 \\ 5 \\ 12 \\ 24 \\ 48 \\ 12 \\ 58 \\ \end{array} $  | $\begin{array}{c} + 1 \\ + 5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ + \\ + \\ +$      | $\frac{3}{6}$ + $\frac{1}{6}$ + $\frac{1}{6}$ + $\frac{3}{6}$ + $\frac{3}{6}$ + $\frac{1}{6}$ + \frac{1}{6} + $\frac{1}{6}$ + \frac{1}{6} + \frac{1}{6} |  | +10<br>$1^{53}$<br>$b^{5}d$<br>10<br>200<br>300<br>16<br>555<br>800<br>1400<br>2400<br>1400<br>3400                             |          | $ \begin{array}{r} + 336 \\ 2^{4} \\ c^{4} \\ \hline \\ 1 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$  |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2 \\ 3 \\ 11 \\ 18 \\ 31 \\ 18 \\ 31 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ 258 \end{array}$  | + 28 $1$ $b$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ | $\begin{array}{c c} 0 & + & \\ & & \\$   | 420<br>++++++++++++++++++++++++++++++++++++   | + 84<br>$1^{62}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{5}_{b^6c}$<br>$1^{$ |       | $\begin{array}{r} + 1680 \\ \hline 18 \\ b^8 \\ \hline 1 \\ \hline 1 \\ 8 \\ \hline 28 \\ \hline 56 \\ \hline 70 \\ \hline 56 \\ \hline 6 \\ \hline 280 \\ \hline 420 \\ \hline 560 \\ \hline 336 \\ \hline 840 \\ \hline 1120 \\ \hline 1680 \\ \hline 2520 \\ \hline 1680 \\ \hline 3360 \\ \hline \end{array}$   |                 |
| 1 <sup>2</sup><br><i>b</i> <sup>2</sup>  |  | +8   | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} 6 \\ 28 \\ 2^{2^{3}} \\ 2^{2^{3}} \\ 2^{2^{3}} \\ \hline 1 \\ 2^{2^{3}} \\ \hline 5 \\ 12 \\ 24 \\ 48 \\ 12 \\ 58 \\ 117 \\ \end{array} $  | $\begin{array}{c} + 1 \\ + 5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ + \\ + \\ +$      | $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{6}$ - $\frac{1}{1}$ + $\frac{3}{3}$ + $\frac{3}{7}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{3}{18}$ + $\frac{3}{108}$ + $\frac{3}{108}$ + $\frac{46}{141}$ + $\frac{1}{258}$ + $\frac{1}{258}$ + $\frac{1}{12}$ + \frac{1}{   |  | +10<br>$1^{53}$<br>$b^{5}d$<br>10<br>20<br>30<br>16<br>555<br>80<br>140<br>240<br>140<br>340<br>570                             |          | $ \begin{array}{r} + 336 \\ 2^{4} \\ e^{4} \\ \hline \\ 1 \\ \hline \\ 1 \\ \hline \\ 1 \\ \hline \\ 28 \\ 48 \\ 90 \\ 24 \\ 108 \\ 204 \\ \end{array} $            |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2 \\ 2^2 c^3 \\ \hline \\ 1 \\ 2 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 8 \\ 31 \\ 1 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ 258 \\ 453 \\ \end{array}$  | + 28 1 b + + + + + + + + + + + + + + + + + +         | $\begin{array}{c c} 0 & + & \\ & & \\$   | +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +   | + 84<br>$1^{62}b^{6}c$<br>1<br>1<br>6<br>15<br>200<br>133<br>51<br>955<br>1500<br>2100<br>108<br>3155<br>4400<br>6900<br>10800<br>6600<br>14400<br>22500   |       | $\begin{array}{r} + 1680 \\ 1^8 \\ b^8 \\ \hline 1 \\ 8 \\ 28 \\ 56 \\ 70 \\ 56 \\ 168 \\ 280 \\ 420 \\ 560 \\ 336 \\ 840 \\ 1120 \\ 1680 \\ 2520 \\ 1680 \\ 3360 \\ 5040 \\ \end{array}$   |                 |
| 1 <sup>5</sup><br><i>b</i> <sup>2</sup><br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+ |  | +8 $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$         | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} \hline 6 \\ 28 \end{array} $ $ \begin{array}{c} 2^{2^{3}} \\ 2^{2^{3}} \\ 2^{2^{3}} \\ \hline \hline 1 \\ 2^{2^{3}} \\ \hline 5 \\ 12 \\ 24 \\ 48 \\ 12 \\ 58 \\ 117 \\ 140 \end{array} $  | $\begin{array}{c} + 1 \\ + 5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ + \\ + \\ +$      | $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{8}$ + $\frac{3}{8}$ + $\frac{1}{1}$ + $\frac{3}{3}$ + $\frac{3}{7}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{3}{108}$ + $\frac{3}{108}$ + $\frac{1}{258}$ + $\frac{3}{340}$ + $\frac{1}{258}$ + $\frac{1}{340}$ + $\frac{1}{258}$ + $\frac{1}{340}$ + $\frac{1}{258}$ + $\frac{1}{$  |  | +10<br>$1^{5}3$<br>$b^{5}d$<br>$1^{5}d$<br>10<br>200<br>300<br>16<br>555<br>800<br>1400<br>2400<br>1400<br>3400<br>5700<br>8000 | 68       | $ \begin{array}{r} + 336 \\ 24 \\ e^4 \\ \hline \\  1 \\ \hline \\  \dots \\ 4 \\ 6 \\ 12 \\ \hline \\  12 \\ 28 \\ 48 \\ 90 \\ 24 \\ 108 \\ 204 \\ 240 \\ \hline $ |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 11 \\ 12 \\ 11 \\ 18 \\ 31 \\ 11 \\ 18 \\ 31 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ 258 \\ 445 \\ 570 \\ \end{array}$   | + 28 1 b + + + + + + + + + + + + + + + + + +         | $\begin{array}{c c} 0 & + & \\ & & \\$   | +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +   | + 84<br>$1^{62}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{$ |       | $\begin{array}{r} + 1680 \\ 1^8 \\ b^8 \\ \hline 1 \\ 8 \\ 28 \\ 56 \\ 70 \\ 566 \\ 168 \\ 280 \\ 420 \\ 560 \\ 336 \\ 840 \\ 1120 \\ 1680 \\ 2520 \\ 1680 \\ 3360 \\ 5040 \\ 6720 \end{array}$   |                 |
| 1 <sup>5</sup><br><i>b</i> <sup>2</sup>  | $\frac{1}{2}$  | +8 $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$         | ++++++++++++++++++++++++++++++++++++++  | $ \begin{array}{c c} \hline 6 \\ 28 \end{array} $ $ \begin{array}{c} 2^{2^{3}} \\ 2^{2}d \\ \hline \hline \hline 1 \\ 2 \\ 5 \\ \hline 12 \\ 24 \\ 48 \\ 12 \\ 58 \\ 117 \\ 140 \\ 284 \\ \end{array} $   | $\begin{array}{c} + 1 \\ + 5 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ + \\ + \\ + \\ + \\ +$ | $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{8}$ + $\frac{3}{8}$ + $\frac{1}{1}$ + $\frac{3}{12}$  |  | +10<br>$1^{5}3$<br>$b^{5}d$<br>10<br>20<br>30<br>16<br>55<br>80<br>140<br>240<br>140<br>340<br>570<br>800<br>1320               |          | $ \begin{array}{r} + 336 \\ 24 \\ c^4 \\ \hline \\ 1 \\ \hline \\ 12 \\ \hline \\ 12 \\ 28 \\ 48 \\ 90 \\ 24 \\ 108 \\ 204 \\ 240 \\ 468 \\ \hline \end{array} $    |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 11 \\ 12 \\ 11 \\ 18 \\ 31 \\ 11 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ 258 \\ 453 \\ 570 \\ 1008 \\ \end{array}$  | + 28 1 b + + + + + + + + + + + + + + + + + +         | $\begin{array}{c c} 0 & + & \\ & & \\$   | +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         + | + 84<br>$1^{62}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{1}_{b^6c}$<br>$1^{$ |       | $\begin{array}{r} + 1680 \\ \hline 18 \\ b^8 \\ \hline 1 \\ \hline 8 \\ 28 \\ \hline 56 \\ \hline 70 \\ \hline 56 \\ \hline 6 \\ 88 \\ 280 \\ \hline 420 \\ \hline 560 \\ \hline 336 \\ \hline 840 \\ \hline 1120 \\ \hline 1680 \\ \hline 2520 \\ \hline 1680 \\ \hline 3360 \\ \hline 5040 \\ \hline 6720 \\ \hline 10080 \\ \end{array}$   |                 |
| 1 <sup>5</sup><br><i>b</i> <sup>2</sup>  | $2^{2}3^{2}2^{2}d^{2}$<br>$2^{2}d^{2}$<br>1<br>1<br>2<br>3<br>6<br>8<br>17<br>44 | +8 $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$         | +<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+<br>+ | $ \begin{array}{c c} \hline 6 \\ 28 \end{array} $ $ \begin{array}{c} 2^{2^{3}} \\ 2^{2^{3}} \\ 2^{2^{3}} \\ \hline \hline 1 \\ 2^{2^{3}} \\ \hline 5 \\ 12 \\ 24 \\ 48 \\ 12 \\ 58 \\ 117 \\ 140 \end{array} $  | + 1<br>+ 5<br>   | $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{6}$ + $\frac{3}{23}$ + $\frac{3}{8}$ + $\frac{3}{8}$ + $\frac{1}{1}$ + $\frac{3}{3}$ + $\frac{3}{7}$ + $\frac{1}{12}$ + $\frac{3}{3}$ + $\frac{3}{108}$ + $\frac{3}{108}$ + $\frac{1}{258}$ + $\frac{3}{340}$ + $\frac{1}{258}$ + $\frac{1}{340}$ + $\frac{1}{258}$ + $\frac{1}{340}$ + $\frac{1}{258}$ + $\frac{1}{$  |  | +10<br>$1^{5}3$<br>$b^{5}d$<br>$1^{5}d$<br>10<br>200<br>300<br>16<br>555<br>800<br>1400<br>2400<br>1400<br>3400<br>5700<br>8000 | 68       | $ \begin{array}{r} + 336 \\ 2^{4} \\ c^{4} \\ \hline \\ 1 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$  |         | $\begin{array}{c c} 7 \ 0 \\ \hline \\ 22^3 \\ 2^2 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 2^3 \\ 11 \\ 12 \\ 11 \\ 18 \\ 31 \\ 11 \\ 18 \\ 31 \\ 6 \\ 39 \\ 68 \\ 117 \\ 204 \\ 84 \\ 258 \\ 445 \\ 570 \\ \end{array}$   | + 28 1 b + + + + + + + + + + + + + + + + + +         | $\begin{array}{c c} 0 & + & \\ & & \\$   | +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +           +         +   | + 84<br>$1^{62}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{6}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{7}_{b^6c}$<br>$1^{$ |       | $\begin{array}{r} + 1680 \\ 1^8 \\ b^8 \\ \hline 1 \\ 8 \\ 28 \\ 56 \\ 70 \\ 566 \\ 168 \\ 280 \\ 420 \\ 560 \\ 336 \\ 840 \\ 1120 \\ 1680 \\ 2520 \\ 1680 \\ 3360 \\ 5040 \\ 6720 \end{array}$   |                 |

VIII (a) Runs on infrà.

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### OF THE ROOTS OF AN EQUATION.

|                |                                      |           |           | V II.    | L(0).          | nui      | is on        | i inn            | a.                    |          |                   |           |            |   |
|----------------|--------------------------------------|-----------|-----------|----------|----------------|----------|--------------|------------------|-----------------------|----------|-------------------|-----------|------------|---|
|                | $\begin{vmatrix} 8\\i \end{vmatrix}$ | 17        | 26        | 126      | 35             | 125      | 135          | 42               | 134                   | $2^{2}4$ | 1224              | 144       | $23^{2}$   |   |
| =              |                                      | bh        | cg        | $b^2g$   | df             | bcf      | $b^3f$       | $e^2$            | bde                   | $c^2e$   | $b^2 ce$          | $b^4e$    | $cd^2$     |   |
| (8)            | - 8                                  | + 8       | + 8       | - 8      | + 8            | -16      | + 8          | + 4              | -16                   | - 8      | + 24              | - 8       | - 8        |   |
| (71)           | + 8                                  | - 1       | - 8       | + 1      | - 8            | + 9      | - 1          | - 4              | + 9                   | + 8      | -10               | + 1       | + 8        |   |
| (62)           | + 8                                  | - 8       | + 4       | + 2      | - 8            | + 4      | -2           | - 4              | + 16                  | - 4      | - 6               | + 2       | + 2        |   |
| (53)           | + 8                                  | - 8       | - 8       | + 8      | + 7            | + 1      | - 3          | - 4              | + 1                   | + 8      | - 9               | + 3       | -7         |   |
| $(4^2)$        | + 4                                  | - 4       | - 4       | + 4      | - 4            | + 8      | - 4          | + 6              | - 8                   | - 4      | + 4               |           | + 4        | - |
| $(61^2)$       | - 8                                  | + 1       | + 2       | -1       | + 8            | - 3      | + 1          | + 4              | - 9                   | -2       | + 4               | -1        | - 5        |   |
| (521)          | - 16                                 | + 9       | + 4       | - 3      | + 1            | - 8      | + 3          | + 8              | - 10                  | - 4      | + 11              | - 3       | + 5        |   |
| (431)          | - 16                                 | + 9       | + 16      | - 9      | + 1            | - 10     | + 4          | - 8              | + 10                  |          | - 1               |           | -1         |   |
| $(42^2)$       | - 8                                  | + 8       | - 4       | -2       | + 8            | - 4      | + 2          | - 4              |                       | + 4      | - 2               |           | -2         |   |
| $(3^{2}2)$     | - 8                                  | + 8       | + 2       | -5       | -7             | + 5      |              | + 4              | - 1                   | - 2      |                   |           | + 1        |   |
| $(51^3)$       | + 8                                  | - 1       | -2        | + 1      | - 3            | + 3      | -1           | - 4              | + 4                   | + 2      | - 4               | + 1       |            |   |
| $(421^2)$      | + 24                                 | -10       | - 6       | + 4      | - 9            | + 11     | - 4          | + 4              | - 1                   | -2       | + 1               |           |            |   |
| $(3^21^2)$     | + 12                                 | - 5       | - 9       | + 5      | + 3            | - 1      |              | + 2              | - 2                   | + 1      |                   | and and a |            |   |
| $(32^{2}1)$    | + 24                                 | -17       |           | + 5      | + 6            | - 3      |              | - 4              | + 1                   |          | Y                 |           |            |   |
| $(2^4)$        | + 2                                  | - 2       | + 2       |          | -2             |          |              | + 1              |                       |          |                   |           |            |   |
| $(41^4)$       | - 8                                  | + 1       | + 2       | -1       | + 3            | - 3      | + 1          |                  |                       |          |                   |           |            |   |
| $(321^3)$      | -32                                  | + 11      | + 8       | -5       | - 3            | + 1      |              |                  | -                     |          |                   |           |            |   |
| $(2^{3}1^{2})$ | - 16                                 | + 9       | - 4       |          | + 1            |          |              |                  | 1                     |          |                   |           | and in the |   |
| $(31^5)$       | + 8                                  | - 1       | - 2       | + 1      |                |          |              |                  |                       |          |                   |           |            | 1 |
| $(2^21^4)$     | +20                                  | - 6       | + 1       |          |                |          |              |                  | 1.4.                  |          |                   |           |            |   |
| $(21^6)$       | - 8                                  | + 1       |           |          |                |          |              |                  |                       |          |                   |           |            | 3 |
| $(1^8)$        | + 1                                  |           | S. 24 1   |          |                |          |              |                  |                       |          |                   |           |            |   |
|                |                                      |           |           |          | 1. L           |          |              | angelin          | 1                     |          | Carl State Street |           |            |   |
|                | 1º32                                 | $12^{2}3$ | 1323      | 153      | 24             | 1223     | 1422         |                  | -                     | 1        |                   |           |            |   |
| =              | $b^2 d^2$                            | $bc^2d$   | $b^{3}cd$ | $b^{5}d$ | c <sup>4</sup> | $b^2c^3$ | $b^{4}c^{2}$ | b <sup>6</sup> c | and the second second | -        |                   |           |            |   |
| (8)            | +12                                  | + 24      | -32       | + 8      | + 2            | - 16     | + 20         | ) - 8            | 8 + 1                 |          |                   |           | -          |   |

| VIII $(b)$ . Runs on in | fra | - | ŝ | ċ |  |  |  | 1 | • |  | 1 |  | 1 | l | l | l |  | l | l | l |  |  | 1 | [ | l | l |  | [ |  |  | l | l | l | 1 |  | 1 |  |  | 1 |  |  |  |  | ł |  | 1 | 1 | 1 |  |  | L |  | 1 | ) |  | í | 1 |  | 1 |  | - |  |  | l | l |  | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L | 1 | ] | 2 | l | ] | į | ) | ) |  |  | 0 | ( | 1 | 1 |  |  |  | 5 | 3 | 5 | 1 | L | 1 | C | ] |  | l | 1 | Ľ | l | 1 | 6 | í |  |  | ł |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | • | • |  |  | ) |
|-------------------------|-----|---|---|---|--|--|--|---|---|--|---|--|---|---|---|---|--|---|---|---|--|--|---|---|---|---|--|---|--|--|---|---|---|---|--|---|--|--|---|--|--|--|--|---|--|---|---|---|--|--|---|--|---|---|--|---|---|--|---|--|---|--|--|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|--|--|---|---|---|---|--|--|--|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|--|--|---|
|-------------------------|-----|---|---|---|--|--|--|---|---|--|---|--|---|---|---|---|--|---|---|---|--|--|---|---|---|---|--|---|--|--|---|---|---|---|--|---|--|--|---|--|--|--|--|---|--|---|---|---|--|--|---|--|---|---|--|---|---|--|---|--|---|--|--|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|--|--|---|---|---|---|--|--|--|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|--|--|---|

|          | $\frac{1^2 3^2}{b^2 d^2}$ | $12^23$ $bc^2d$   | $1^{3}23$<br>$b^{3}cd$ | $1^{5}3$<br>$b^{5}d$ | $2^4$ $c^4$     | $1^{2}2^{3}$<br>$b^{2}c^{3}$ | ${142^2\over b^4c^2}$ | $\frac{1^{6}2}{b^{6}c}$ | $\begin{vmatrix} 1^8 \\ b^8 \end{vmatrix}$ |
|----------|---------------------------|-------------------|------------------------|----------------------|-----------------|------------------------------|-----------------------|-------------------------|--|
| = (8)    | $\frac{0.0}{+12}$         | +24               | $\frac{0.00}{-32}$     | + 8                  | + 2             | $\frac{00}{-16}$             | $\frac{00}{+20}$      | -8                      | $\frac{0}{+1}$                             |
| (71)     | $\frac{+12}{-5}$          | $\frac{+21}{-17}$ | $\frac{-52}{+11}$      | $\frac{+0}{-1}$      | $\frac{+2}{-2}$ | $\frac{-10}{+9}$             | $\frac{+20}{-6}$      | $\frac{-0}{+1}$         | <u> </u>                                   |
| (62)     | - 9                       |                   | + 8                    | $\frac{1}{-2}$       | + 2             | - 4                          | $\frac{1}{+1}$        |                         |  |
| (53)     | + 3                       | + 6               | - 3                    |                      | -2              | + 1                          | - 189                 |                         | 1356                                       |
| $(4^2)$  | + 2                       | - 4               |                        |                      | + 1             | THOR                         |                       | 1                       |  |
| (612)    | + 5                       | + 5               | - 5                    | +1                   | 01-             | 2008                         | - 11                  |                         | 00.00                                      |
| (521)    | - 1                       | - 3               | + 1                    | 1024                 | 1-35            |                              | -103                  | 1 mil                   | 1.5.5.6                                    |
| (431)    | - 2                       | + 1               |                        | 0.501                | ASI.            | -514(00                      |                       |                         | E.C.S.C.                                   |
| $(42^2)$ | + 1                       |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 | 141.                         |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          | -                         |                   |                        | <u></u>              |                 |                              |                       |                         |  |
|          |                           |                   | 1 2                    |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |
|          |                           |                   |                        |                      |                 |                              |                       |                         |  |

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| 1              | $\begin{vmatrix} 9\\ j \end{vmatrix}$ | 18<br>  bi | 27<br>ch      | $\frac{1^27}{b^2h}$ | $35 \\ dg$ | 125<br>bcg | $\begin{vmatrix} 1^3\\b^3\end{vmatrix}$ | $\frac{36}{g}$ | 45<br>ef | $\begin{array}{c} 135\\ bdf \end{array}$  |   | $2^{2}5$<br>$2^{2}f$ |   | <sup>2</sup> 25<br><sup>2</sup> cf |        | 45<br>4 <i>f</i> | $egin{array}{c} 14^2 \ be^2 \end{array}$ |
|----------------|---------------------------------------|------------|---------------|---------------------|------------|------------|---|----------------|----------|---|---|----------------------|---|------------------------------------|--------|------------------|--|
| (9)            |                                       | 1          | 100           |                     |            |            |   | -              |          | 12 2 17   |   | 1.                   |   | R                                  | 100    |                  | - 10 - 10                                |
| (81)           |                                       | -          | 1             |                     | 12-        | The sta    |   | 2              |          |   |   |                      |   | 6                                  | 101    | 1                |  |
| (72)           | - 1.4                                 |            | 1.            | 10.1                | 170        | b          |   | 8              | 148      | 1   |   | 1                    |   | 2                                  | /2 F   | -                |  |
| (63)           | 1                                     |            | 1 Tree        |                     | Thr        | 18 2 13    |   | 19             |          | Call In   | - | 0                    |   | ard                                | 150    | as l             |  |
| (54)           | -                                     |            |               |                     | 013        |            | 3                                       | 10             | TTE      | e la  |   | 10                   |   | ari                                | 100    |                  |  |
| $(71^2)$       |                                       |            | 1.            |                     |            | 12.21      |   | 1              | 3 8 5    | 80013   |   | R                    |   | 8 1                                | Tee    | 17-11            | a les polities                           |
| (621)          |                                       |            |               |                     | 1          |            |   | a              |          | 3777  | 1 | R                    |   | 8 1                                | 108    | 1                |  |
| (531)          |                                       |            |               |                     | 1          |            |   | 2              | 1 2 1    | 1 1 3   |   | T                    |   | 2 4                                |        | AL I             |  |
| $(4^{2}1)$     | -                                     |            |               | 10                  | 1          |            | 1                                       | 11             |          | 2.1.7   |   | OT                   |   | B State                            | -1270  |                  |  |
| $(52^2)$       |                                       |            |               |                     | 10         | 18- J.     |   | 1              |          |   |   | 1 83                 |   | a rai                              | -7215  | 6                |  |
| (432)          |                                       |            |               |                     |            |            |   | 8              | That T   | 80110   |   | 4                    |   | rent                               | 5/10   | 14               |  |
| $(3^3)$        |                                       |            |               |                     |            | T          |   |                | TRU      |   |   | 1 Contra             |   | X                                  | 100    | 24               |  |
| $(61^3)$       |                                       |            |               |                     |            |            |   | 8              |          | 1   |   | 1 and                |   | a Xt                               | in a   | 371              |  |
| $(521^2)$      |                                       |            | A Same        |                     |            | 1          |   | T              |          | 18-11   |   | TR                   | 3 | CAN D                              | - inst | and a            | •  |
| $(431^2)$      |                                       |            |               |                     | 100        |            |   | 3              | THE ST   | 117.45  |   | 105                  |   | afet                               | 172 11 | Bill             |  |
| $(42^{2}1)$    | 1                                     |            |               |                     |            |            |   |                |          | They la   |   | 158.57               |   | aball                              | 11/18  |                  |  |
| $(3^{2}21)$    | 1                                     |            |               |                     |            | 1000       |   |                |          | The second se | 1 | 123                  |   | doll                               | trest  | 24.6             | 1.4.4.2.1                                |
| $(32^3)$       |                                       |            | r area        |                     |            |            | 1                                       | Th             |          |   |   | 120                  |   | 410                                | + anti | 100              | - 1                                      |
| $(51^4)$       |                                       |            | - m           |                     |            | N. H. LAG  |   |                |          | 1. 200  |   | (CAN)                |   | 1040                               | -      | 1                |  |
| $(421^3)$      |                                       |            | 1             |                     |            |            |   |                |          |   |   |                      | - | 1                                  | -      | 4                |  |
| $(3^21^3)$     |                                       |            |               |                     | 139.14     | gardin in  |   | 14.64          |          | 8ª1 94  | - | 1                    | - | 2                                  | -1     | 6                |  |
| $(32^21^2)$    |                                       |            | - facts       |                     |            | gal a      | 13.8                                    | 1000           | 1 Start  | - 1   |   | 2                    | - | 5                                  | -      | 12               | - 2                                      |
| $(2^41)$       |                                       |            |               |                     |            | 8-10       |   | 16             | - 1      | - 4   | - | 6.                   | - | 12                                 | +8)    | 24               | - 9                                      |
| $(41^5)$       |                                       |            |               |                     |            | 14 8.      | -                                       | 1              |          |   |   |                      | - | 5                                  | -11    | 21               |  |
| $(321^{4})$    |                                       |            |               |                     |            | - 1        | -                                       | 3              |          | - 4   |   | 9                    | - | 23                                 | 188    | 58               | - 6                                      |
| $(2^{3}1^{3})$ |                                       |            | 1. The second |                     | - 1        | - 3        | -                                       | 6              | - 3      | - 15  |   | 24                   | - | 51                                 | +8.8   | 108              | - 24                                     |
| $(31^6)$       | 1                                     |            | 1             | - 1                 |            | - 6        | -                                       | 19             |          | - 15  |   | 30                   | - | 81                                 | to k   | 204              | - 20                                     |
| $(2^21^5)$     |                                       |            | -1            | -2                  | - 5        | - 17       | -                                       | 36             | - 10     | - 50  |   | 81                   | - | 172                                | -11    | 366              | - 70                                     |
| $(21^7)$       |                                       | -1         | - 7           | -15                 | -21        | - 70       |   |                | - 35     | -161  |   | 252                  | - | 525                                |        | 092              | -210                                     |
| $(1^9)$        | -1                                    | - 9        | - 36          | -72                 | - 84       | -252       |   | 504            | -126     | -504  | - | 756                  | - | 1512                               | - 3    | 8024             | - 630                                    |

IX (a). Runs on to p. 430.

| 11              | 234<br>cde   | $\begin{vmatrix} 1^2 34 \\ b^2 de \end{vmatrix}$ | 7 8    | $\frac{12^24}{bc^2e}$                  |         | <sup>3</sup> 24<br><sup>3</sup> ce |      | 1 <sup>5</sup> 4<br>b <sup>5</sup> e |      | $\frac{3^3}{d^3}$ |                    | $123^2$ |   | ${1^3 3^2 \over b^3 d^2}$ |     | $2^{3}3$<br>$c^{3}d$ |   | $^{2}2^{2}3$<br>$^{2}c^{2}d$ |
|-----------------|--------------|--|--------|--|---------|------------------------------------|------|--------------------------------------|------|-------------------|--------------------|---------|---|---------------------------|-----|----------------------|---|------------------------------|
| (9)             | - 8 -        | 9++  |        |  | -       | 21 1-4                             | 180  | 4-91                                 | -    | §                 | 13                 | and the |   | 17 1 4 4                  |     |                      |   |                              |
| (81)            | and the part | Land   | 1      |  |         | 212                                | 12   |                                      | -    | 34                | 01                 | 4.9     |   |                           |     | ) (48)               |   |                              |
| (72)            | + 84 -       | 2  |        |  |         | and the second                     |      | - 21                                 | 1    | 31+               | -                  |         |   |                           | -   | (81)                 |   |                              |
| (63)            | +, 88-       | - 9  |        | * 4                                    | 1 de la | 0 -                                |      | - 8                                  | -    |                   |                    |         |   | 9                         |     |                      |   |                              |
| (54)            | 128 -        | 2.   | 641    | + +                                    | 1.0     | ()                                 | 1.R  | na gipa                              | 4.1  |                   |                    |         |   | 11 4 1                    |     | 1 (46)               | 1 |                              |
| $(71^2)$        | 1-12 T-      | 1-4  | d le l | and the                                | 8       | 2                                  | 13   | in the                               |      | I man             | 01                 |         |   | 12                        |     | 1 (305)              |   |                              |
| (621)           | -2621        | 10   |        |  | T.L.    |                                    | 18   | 4 8 -                                |      | 8                 |                    | 8       | 4 | 14.                       | 1   | 521)                 |   |                              |
| (531)           | - [14004     | 10++   | In all | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | 08      | 1-                                 | 1.3  |                                      |      |                   |                    |         |   |                           | -   | 16186                | - | 1                            |
| $(4^{2}1)$      |              |  | 200    |  | 10      | 11-1-                              | 14   | 6 - 10                               | - 0: |                   | 6                  | 08.1    |   | 10                        | -   | 1                    | - | 2                            |
| $(52^2)$        |              |  | 202    | - 71                                   | 18      | 1                                  |      | 14.2.5-                              | 1.0  |                   | 3                  | 06      | - | 1                         |     |                      | - | 2                            |
| (432)           | 12600        | 10-4   | 00     |  | 68.     | 1-1-1                              | - 01 | 小小                                   | ×    | 1                 | -                  | 1       | - | 3                         | -   | 3                    | - | 8                            |
| $(3^3)$         | 1680-1       | 1-20-1   | 080    |  | 040     | S I and                            | 121  |                                      | -    | 1                 | -                  | 3       | - | 6                         | -   | 6                    | - | 15                           |
| $(61^{3})$      | 51106-       | 11++   | _      | 4 4                                    | 36      |                                    | -    | 1                                    |      |                   |                    |         | _ |                           | 144 |                      |   |                              |
| $(521^{\circ})$ | N 121 61     | 11-1-1   |        |  | -       | 1                                  | -    | 5                                    | 14   |                   | -                  |         | - | 2                         | -   |                      | - | 5                            |
| $(431^2)$       | 108.98       | 1. Same  |        |  | -       | 3                                  | -    | 10                                   | 1.8  |                   |                    | 2       | - | 6                         | -   | 7                    | - | 19                           |
| $(42^{2}1)$     | - 108.48     |  | 1 -    |  | -       | 7                                  | -    | 20                                   | 18   |                   | -                  | 5       | - | 17                        | -   | 12                   | - | 36                           |
| $(3^{2}21)$     | - 1          |  | 2      |  | -       | 12                                 | -    | 30                                   | -    | 3                 | -                  | 13      | - | 30                        | -   |                      | - | 65                           |
| $(32^3)$        | - 3          | -  | 7 -    | - 12                                   | -       | · 27                               | _    | 60                                   | -    | 6                 | -                  | 27      | - | 64                        | -   | 51                   | _ | 120                          |
| $(51^4)$        |              |  |        |  | -       | 4                                  | _    | 21                                   |      |                   |                    |         | - | 6                         |     |                      | - | 12                           |
| $(421^3)$       | ,            |  | 3 _    |  | -       | . 25                               | -    | 75                                   | 1.St |                   | -                  | 12      | - | 42                        | -   | 27                   | _ | 85                           |
| $(3^21^3)$      | - 3          |  | 6 _    |  | -       | 42                                 | -    | 110                                  | _    | 6                 | -                  | 30      | - | 72                        | -   | 64                   | - | 152                          |
| $(32^21^2)$     | - 8          | - 1  | 9 -    |  | _       | 85                                 | -    | 200                                  | -    | 15                | _                  | 65      | - | 152                       | -   | 120                  | - | 281                          |
| $(2^{4}1)$      | - 22         | - 4  |        | - 78                                   |         | 168                                | -    | 360                                  | -    | 36                | -                  | 136     | - | 300                       | -   | 234                  | - | 516                          |
| $(41^5)$        |              | - 1  |        |  | _       | 75                                 | -    | 225                                  | 10   |                   | -                  | 30      | - | 110                       | -   | 60                   | - | 200                          |
| $(321^{4})$     | - 22         | - 5  |        |  | _       | 241                                | -    | 570                                  | 1-   | 36                | -                  | 158     | - | 372                       | -   | 282                  | - | 656                          |
| $(2^{3}1^{3})$  | - 60         | -12  |        |  | -       | 459                                | -    | 990                                  | -    |                   | -                  | 333     | - | 720                       | -   | 555                  | - | 1203                         |
| $(31^{6})$      | <u>- 60</u>  | - 15   |        |  | 1       |                                    | -    | 1500                                 | -    | 90                | -                  | 390     | - | 920                       | -   | 660                  | _ | 1530                         |
| $(2^21^5)$      | -165         | - 35   |        |  |         | 1200                               | 1-20 | 2550                                 | -    | 240               | -                  | 820     | - | 1740                      | 1   | 1320                 | _ | 2800                         |
| (217)           | - 455        | - 94   |        | - 1470                                 |         | 3045                               |      |                                      | -    | 630               | And a state of the | 2030    |   | 4200                      |     | 3150                 | _ | 6510                         |
| $(1^9)$         | -1260        | -252   | 0 -    | - 3780                                 | -       | 7560                               | -    | 15120                                | -    | 1680              | -                  | 5040    | - | 10080                     | -   | 7560                 | - | 15120                        |

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|                |   | $1^{4}23$<br>$b^{4}cd$ |   | $\begin{array}{c c}1^{6}3\\b^{6}d\end{array}$ |       | $12^4 \\ bc^4$ | 1.11 | $1^{3}2^{3}$<br>$b^{3}c^{3}$ |   | $\frac{1^5 2^2}{b^5 c^2}$ |   | 172<br>b7c | 231 | 19<br>69 |
|----------------|---|------------------------|---|---|-------|----------------|------|------------------------------|---|---------------------------|---|------------|-----|----------|
| (9)            |   | <u> </u>               |   | <u> </u>                                      |       | 00-            | -    | 0-0-                         |   | 0.0                       |   | 0.0        | -   | 1        |
| (81)           |   |                        |   |   | 1     |                | -    | -                            | - |                           | _ | 1          | -   | 9        |
| (72)           | - |                        |   |   |       |                | -    |                              | - | 1                         | - | 7          | -   | 36       |
| (63)           |   |                        |   |   |       |                | -    | 1                            | - | 5                         | - | 21         | -   | 84       |
| (54)           |   |                        |   |   | -     | 1              | -    | 3                            | - | 10                        | _ | 35         | -   | 126      |
| $(71^2)$       |   |                        | - | 1   | 1.1.3 |                |      |                              | - | 2                         | - | 15         | -   | 72       |
| (621)          | - | 1                      | - | 6   | 1     |                | -    | 3                            | - | 17                        | - | 70         | -   | 252      |
| (531)          | - | 4                      | - | 15  | -     | 4              | -    | 15                           | - | 50                        | - | 161        | -   | 504      |
| $(4^21)$       | - | 6                      | - | 20  | -     | 9              | -    | 24                           | - | 70                        | - | 210        | -   | 630      |
| $(52^2)$       | - | 9                      | - | 30  | -     | 6              | -    | 24                           | - | 81                        | - | 252        | -   | 756      |
| (432)          | - | 22                     | - | 60  | -     | 22             | -    | 60                           | - | 165                       | - | 455        | -   | 1260     |
| (33)           | - | 36                     | - | 90  | -     | 36             | -    | 93                           | - | 240                       | - | 630        | -   | 1680     |
| $(61^3)$       | - | 3                      | : | 19  |       |                | -    | 6                            | - | 36                        | - | 147        | -   | 504      |
| $(521^2)$      | 4 | 23                     | - | 81  | -     | 12             | -    | 51                           | - | 172                       | - | 525        | -   | 1512     |
| $(431^2)$      | - | 54                     | - | 155   | -     | 48             | -    | 129                          | - | 350                       | - | 945        | -   | 2520     |
| $(42^{2}1)$    | - | 101                    | - | 270   | -     | 78             | -    | 213                          | - | 565                       | - | 1470       | -   | 3780     |
| $(3^{2}21)$    | - | 158                    | - | 390   | -     | 136            | -    | 333                          | - | 820                       | - | 2030       | -   | 5040     |
| $(32^3)$       | - | 282                    | - | 660   | -     | 234            | -    | 555                          | - | 1320                      | - | 3150       | -   | 7560     |
| $(51^4)$       | - | 58                     | - | 204   | -     | 24             | -    | 108                          | - | 366                       | - | 1092       | -   | 3024     |
| $(421^3)$      | - | 241                    | - | 645   | -     | 168            | -    | 459                          | - | 1200                      | - | 3045       | -   | 7560     |
| $(3^21^3)$     | - | 372                    | - | 920   | -     | 300            | -    | 720                          | - | 1740                      | - | 4200       | -   | 10080    |
| $(32^21^2)$    | - | 656                    | - | 1530  | -     | 516            | -    | 1203                         | - | 2800                      | - | 6510       | -   | 15120    |
| $(2^{4}1)$     | - | 1140                   | - | 2520  | -     | 906            | -    | 2016                         | - | 4500                      | 4 | 10080      | -   | 22680    |
| (415)          | - | 570                    | - | 1500  | -     | 360            | -    | 990                          | - | 2550                      | - | 6300       | -   | 15120    |
| $(321^4)$      | - | 1516                   | - | 3480  | -     | 1140           | -    | 2610                         | - | 5940                      | - | 13440      | -   | 30240    |
| $(2^{3}1^{3})$ | - | 2610                   | - | 5670  | -     | 2016           | -    | 4383                         | - | 9540                      | - | 20790      | -   | 45360    |
| $(31^6)$       | - | 3480                   | - | 7800  | -     | 2520           | -    | 5670                         | 1 | 12600                     | - | 27720      | -   | 60480    |
| $(2^21^5)$     | - | 5940                   | 1 | 12600   | -     | 4500           | -    | 9540                         |   | 20220                     | - | 42840      | -   | 90720    |
| (217)          | - | 13440                  | - | 27720   | -     | 10080          | -    | 20790                        | - | 42840                     | - | 88200      | -   | 181440   |
| (19)           | - | 30240                  | - | 60480   | -     | 22680          | -    | 45360                        | - | 90720                     | - | 181440     | -   | 362880   |

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IX (b). Runs on to p. 432.

|                | 9    | 18   | 27   | 127    | 35   | 125  | 136    | 45              | 135  | 225     | 1225     | 145    | 142             | 234  | 1234     |
|----------------|------|------|------|--------|------|------|--------|-----------------|------|---------|----------|--------|-----------------|------|----------|
| =              | j    | bi   | ch   | $b^2h$ | dg   | bcg  | $b^3g$ | ef              | bdf  | $c^2 f$ | $b^2 cf$ | $b^4f$ | $be^2$          | cde  | $b^2 de$ |
| (9)            | - 9  | + 9  | + 9  | - 9    | + 9  | - 18 | + 9    | + 9             | -18  | - 9     | + 27     | - 9    | - 9             | -18  | + 27     |
| (81)           | + 9  | - 1  | - 9  | + 1    | - 9  | + 10 | - 1    | - 9             | +10  | + 9     | - 11     | + 1    | + 5             | + 18 | -11      |
| (72)           | + 9  | - 9  | + 5  | + 2    | - 9  | + 4  | -2     | - 9             | + 18 | - 5     | - 6      | +2     | + 9             | + 4  | -20      |
| (63)           | + 9  | - 9  | - 9  | + 9'   | + 9  |      | - 3    | - 9             |      | + 9     | - 9      | + 3    | + 9             |      | - 9      |
| (54)           | + 9  | - 9  | - 9  | + 9    | - 9  | + 18 | - 9    | + 11            | - 2  | -1      | - 7      | + 4    | - 11            | -2   | + 13     |
| $(71^2)$       | - 9  | + 1  | + 2  | - 1    | + 9  | - 3  | + 1    | + 9             | -10  | -2      | + 4      | -1     | - 5             | -11  | + 11     |
| (621)          | -18  | +10  | + 4  | - 3    |      | - 8  | + 3    | + 18            | -10  | - 4     | + 11     | - 3    | - 14            | - 4  | +13      |
| (531)          | -18  | + 10 | + 18 | - 10   |      | - 10 | + 4    |                 | - 5. |         | +15      | - 4    | + 6             | + 2  | - 5      |
| $(4^21)$       | - 9  | + 5  | + 9  | - 5    | + 9  | - 14 | + 5    | -11             | + 6  | + 1     | - 1      |        | + 5             | + 2  | - 5      |
| $(52^2)$       | - 9  | + 9  | - 5  |        | + 9  | - 4  | + 2    | - 1             | - 8  |         | + 6      | -2     | + 1             | + 6  |          |
| (432)          | -18  | + 18 | + 4  | - 11   |      | - 4  | +5     | $\frac{-2}{+3}$ | + 2  | + 6     | - 5      |        | $\frac{+2}{-3}$ | - 8  | + 1      |
| $(3^3)$        | - 3  | + 3  | + 3  | - 3    | - 6  | + 3  |        |                 | + 3  | - 3     |          |        |                 | + 3  |          |
| $(61^{3})$     | + 9  | - 1  | - 2  | + 1    | - 3  | + 3  | -1     | - 9             | + 4  | +2      | - 4      | + 1    | + 5             | + 5  | - 5      |
| $(521^2)$      | + 27 | - 11 | - 6  | + 4    | - 9  | + 11 | - 4    | - 7             | +15  | + 6     | -15      | + 4    | - 1             | - 5  | + 1      |
| $(431^2)$      | +27  | - 11 | - 20 | + 11   | - 9  | +13  | - 5    | + 13            | - 5  |         | + 1      |        | - 5             | + 1  | + 2      |
| $(42^{2}1)$    | +27  | - 19 | + 1  | + 5    | - 9  | + 12 | - 5    | + 3             | - 2  | - 6     | + 3      |        | + 1             | + 2  | - 1      |
| $(3^{2}21)$    | +27  | - 19 | - 13 | + 12   | + 18 | - 7  |        | - 7             | - 4  | + 3     |          |        | + 3             | - 1  |          |
| $(32^3)$       | + 9  | - 9  | + 5  | + 2    | - 3  | - 2  |        | + 1             | + 2  |         |          |        | - 1             |      |          |
| $(51^4)$       | - 9  | + 1  | + 2  | - 1    | + 3  | - 3  | + 1    | + 4             | - 4  | -2      | + 4      | -1     |                 |      |          |
| $(421^3)$      | - 36 | + 12 | + 8  |        | + 12 | - 14 | + 5    |                 | + 1  | + 2     | - 1      |        |                 |      |          |
| $(3^21^3)$     | -18  | + 6  | + 11 | - 6    | - 3  | + 1  |        | - 2             | + 2  | -1      |          |        |                 |      |          |
| $(32^21^2)$    | -54  | +30  | + 5  | - 9    | - 9  | + 4  |        | + 4             | - 1  |         |          |        |                 |      | 1        |
| $(2^41)$       | - 9  | + 7  | - 5  |        | + 3  |      |        | - 1             |      |         |          |        |                 |      |          |
| $(41^5)$       | + 9  | - 1  | - 2  | + 1    | - 3  | + 3  | -1     |                 |      |         |          |        |                 |      |          |
| $(321^{4})$    | + 45 | -13  | - 10 | + 6    | + 3  | - 1  |        |                 |      |         |          |        |                 |      |          |
| $(2^{3}1^{3})$ | +30  | -14  | + 5  |        | - 1  |      |        |                 |      |         |          |        |                 |      |          |
| $(31^{6})$     | ÷ 9  | + 1  | + 2  | - 1    |      |      |        |                 |      |         | -        |        |                 |      |          |
| $(2^21^5)$     | -27  | + 7  | - 1  |        |      |      |        |                 |      |         |          |        |                 |      |          |
| (217)          | + 9  | - 1  |      |        |      |      |        |                 |      |         |          |        |                 |      |          |
| $(1^9)$        | - 1  |      |      | -      |      | -    |        |                 |      |         |          |        |                 |      |          |

|           | $ 12^{2}4 $ | 1324          |                |               | $123^{2}$                | 1333           | 233      | $ 1^2 2^2$   |                       |        | 124      | 1323          | 1522           | 172    | $\frac{1^9}{b^9}$ |
|-----------|-------------|---------------|----------------|---------------|--------------------------|----------------|----------|--|-----------------------|--------|----------|---------------|----------------|--------|-------------------|
| =         | $bc^2e$     | $b^{3}ce$     | $b^5e$         | $d^3$         | $bcd^2$                  | $b^3d^2$       | $c^{3}d$ |  |                       | $b^6d$ | $bc^4$   | $b^{3}c^{3}$  | $b^{5}c^{2}$   | $b^7c$ |                   |
| (9)       | + 27        | - 36          | + 9            |               | + 27                     | - 18           | + 9      | CONST  |                       |        | - 9      | + 30          | -27            |        | - 1               |
| (81)      | -19         | + 12          | -1             | + 3           | -19                      | + 6            | - 9      | + 30   |                       |        | + 7      | -14           | + 7            | -1     |                   |
| (72)      | + 1         | + 8           | -2             | + 3           | -13                      | + 11           | + 5      | + 4  |                       | + 2    | - 5      | + 5           | - 1            |        |                   |
| (63)      | - 9         | + 12          | - 3            | - 6           | + 18                     | - 3.           | - 3      | A Contraction of the second  | ) + 3                 |        | + 3      | - 1           |                |        |                   |
| (54)      | + 3         | - 4           |                | + 3           | - 7                      | - 2            | +1       |  | 1                     |        | -1       |               |                |        |                   |
| $(71^2)$  | + 5         | - 5           | + 1            | - 3           | + 12                     | - 6            | + 2      |  | 9 + 6                 |        |          |               |                |        |                   |
| (621)     | + 12        | -14           | + 3            | + 3           | - 7                      | + 1            | -2       |  | $\frac{1}{1}$ - 1     |        |          |               |                |        | 1 7 7             |
| (531)     | - 2         | + 1           |                | + 3           | - 4                      | + 2            | + 2      | -  | 1                     |        |          |               |                |        |                   |
| $(4^21)$  | + 1         |               |                | - 3           | + 3                      |                | -1       |  |                       |        |          |               | 01 - BO.       | 22     |                   |
| $(52^2)$  | - 6         | + 2           |                | - 3           | + 3                      | - 1            |          |  |                       |        |          |               |                |        |                   |
| (432)     | + 2         |               |                | + 3           | - 1                      |                |          |  |                       |        |          |               | C              |        | 1351              |
| $(3^3)$   |             |               |                | -1            |                          | and a first    |          |  |                       |        |          |               |                |        |                   |
| $(61^3)$  | - 5         | + 5           | -1             |               |                          |                |          | and a second | and the second second |        | 1.6      | - Aller       |                |        |                   |
| $(521^2)$ | + 3         | - 1           |                | inck          | AND AND                  | * 6            |          | Color of the second  |                       |        | - marine |               | 0.000          |        | 1.5.5             |
| $(431^2)$ | - 1         |               |                | arrea has     | antication in the second | and and        |          | The second second  |                       |        | -        | -             | 1              |        |                   |
|           |             | - Alera and   |                |               |                          |                |          |  |                       |        | 1        |               | Linear         |        |                   |
|           |             |               | See la fa      |               |                          |                | 17.      |  |                       |        | 1 1      |               |                |        |                   |
|           |             |               | 110            |               | and a start              | - The Street   | The las  |  |                       |        |          |               | 10000          |        |                   |
|           | 27718       | 1 - The Jacob |                | - Andrewski - |                          |                |          | 12.92  |                       |        | 1.25     |               | 67.000         | 1 - 1  | 1.64.6            |
|           | N. T.R.     | The parts     |                |               | The state                |                |          |  |                       |        |          | <u>ad 121</u> | 10-10-00-0     | 39     | T C R P           |
|           |             |               |                |               |                          | and the second |          |  |                       |        |          |               | 1 2140 2       |        |                   |
|           |             |               |                |               | 1217                     |                |          |  |                       | -      |          | 0.02 Med      | 0.000          | -      | 1111              |
|           | 5.17        |               |                |               |                          |                |          | 22.291   |                       | -      |          | -             | 0.1000         |        | 150               |
|           |             |               |                |               |                          |                |          |  | -                     | -      |          | 10 1 mm       | 0000           | -      | TANK N            |
|           | 1.4.1.7     |               |                |               |                          | -              |          |  | 1                     | -      |          | 001-          | Torretta       |        | 1.(2)             |
|           |             |               |                |               |                          |                |          |  |                       | -      | -        | -             | 11000          | -      |                   |
|           |             |               |                |               | 0                        |                |          |  |                       | -      |          | 0             | Colorer (      | - 10   | 1                 |
|           |             |               |                |               |                          |                |          |  |                       | -      | 1.1200   | 00            | 21000          | -      |                   |
|           |             |               |                |               |                          | -              |          |  | -                     | -      |          | 2011          | 100+0          |        | -+-               |
|           |             |               |                |               |                          |                |          | -  |                       | -      |          | 10            | 10000          |        |                   |
|           | 1           |               | and the second | 1000          |                          | 17 N 18 19 19  | 1        | 1  |                       |        |          |               | Contraction of | 1      | Harris and        |

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| 11             | $\begin{vmatrix} 10 \\ k \end{vmatrix}$ | $\begin{vmatrix} 19\\bj \end{vmatrix}$ | 1 | 28<br>ci | 3   | $\frac{1}{b}$ | 28<br>2i | 37<br>dh   |   | 127<br>bch |   | 1 <sup>3</sup> 7<br>b <sup>3</sup> h |   | 6<br>q | $\begin{vmatrix} 1\\b \end{vmatrix}$ | $\frac{36}{dg}$ | 1   | $2^26$<br>$c^2g$ |     | $1^226$<br>$b^2cg$ | - | $1^{4}6 \\ b^{4}g$    | $\left  \begin{array}{c} 5^2 \\ f^2 \end{array} \right $ |
|----------------|---|--|---|----------|-----|---------------|----------|------------|---|------------|---|--------------------------------------|---|--------|--------------------------------------|-----------------|-----|------------------|-----|--------------------|---|-----------------------|--|
| (10)           |   |  |   |          | -   |               |          |            |   |            |   |                                      |   |        | -                                    |                 |     | - 9              |     |                    |   |                       |  |
| (91)           |   | -                                      |   |          |     |               |          |            |   |            | - |                                      |   |        | -                                    |                 |     |                  | -   | 1                  |   |                       | (19)   |
| (82)           | 1000                                    |  |   |          |     | -             |          |            | - |            | - |                                      |   |        |                                      | 1.1             |     |                  |     |                    | - |                       | (88)   |
| (73)           |   |  |   |          |     |               |          |            |   |            |   |                                      |   | 113    |                                      |                 |     |                  |     |                    |   |                       | (8))   |
| (64)           |   |  |   |          |     |               |          |            |   |            | - |                                      |   |        |                                      |                 |     |                  |     | 1000               |   |                       | ( <del>4</del> 0) -                                      |
| $(5^2)$        |   |  |   |          |     |               |          | -4         |   |            |   |                                      | - |        |                                      |                 |     |                  |     |                    |   |                       |  |
| $(81^2)$       |   |  |   |          |     |               |          | -          |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | S. 24/1  |
| 721)           |   |  |   |          |     |               |          |            |   |            | - |                                      |   |        |                                      | •               |     |                  |     |                    |   |                       | (141)  |
| 631)           | ·                                       |  |   |          |     |               |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (189)  |
| 541)           |   |  |   |          |     |               |          |            |   | 1.1        |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (186)  |
| $(62^2)$       |   |  |   |          |     | 124           |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (220)  |
| 532)           |   | -                                      |   |          |     |               | 1        |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (296)  |
| $(4^{2}2)$     |   |  |   | • •      |     |               |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (2,7)  |
| $(43^2)$       |   |  |   |          |     |               | teter -  |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | Care a de  |
| $(71^3)$       | 1                                       |  |   |          |     |               |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (24.3)   |
| $21^{2}$ )     |   |  |   |          |     |               |          |            |   |            |   |                                      |   |        |                                      | -               |     |                  |     |                    |   |                       | (1700.   |
| $31^{2}$ )     |   |  |   |          |     |               |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   | and the second second | 1300   |
| $(1^2 1^2)$    |   | 2                                      |   |          | -   |               |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    | 1 |                       | ((1,2)   |
| $2^{2}1)$      |   |  |   |          |     |               |          | 1          |   | R.S.       |   |                                      |   |        |                                      |                 |     |                  |     | 1                  |   |                       | (146.0   |
| 321)           | 1302                                    |  |   |          |     |               | 8        |            |   | t.E.       |   |                                      |   |        |                                      |                 | 101 |                  |     |                    |   | 2011                  |  |
| $(3^{3}1)$     |   |  |   |          | 1   |               | 100      |            |   |            |   |                                      |   |        |                                      | 1               |     |                  |     |                    |   |                       | (183)  |
| $(42^3)$       |   |  |   |          |     |               | Lat      |            |   |            |   | -                                    |   |        |                                      |                 |     |                  |     |                    |   |                       | 1.57 1.1   |
| $3^{2}2^{2}$   | 13851                                   |  |   |          |     |               |          |            |   | 14         |   | 3213                                 |   |        |                                      |                 |     |                  |     |                    |   |                       | Carico   |
| (614)          |   |  |   | 1        |     | 107-          |          |            |   |            |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       | (cro)  |
| $(21^3)$       | 1003                                    |  |   |          |     | 2 Fr          |          |            |   |            |   |                                      |   | 1.1.   |                                      |                 |     |                  |     |                    |   |                       | (-136)   |
| 313)           |   |  |   | 24       |     |               | 22       |            |   | 14         |   | 1.80                                 |   |        |                                      |                 |     |                  |     |                    |   |                       | 12.04  |
| $2^{2}1^{2}$ ) | 27                                      |  |   | 3        | 1   |               | 1        | The second |   | 14         |   |                                      |   |        |                                      |                 |     |                  |     |                    |   |                       |  |
| 2212)          | 381                                     | all Ch                                 |   |          |     |               | 200      | -14        |   | 120        |   |                                      |   |        |                                      |                 |     |                  |     | 1                  |   |                       | 11.240   |
| 3231)          | •                                       | 1 21                                   |   |          |     |               | 1995     |            |   |            |   |                                      |   | 1      |                                      |                 | 3.4 | •                | 660 |                    |   |                       | (1-220)  |
| (25)           | 8-1-11                                  | 1 20                                   |   |          | 201 | 8 8           | 39       | -1/2       |   |            |   | 300                                  |   |        | - Sing                               |                 |     |                  |     |                    |   |                       | + ]  |
| (515)          | 1122                                    |  |   |          |     | 1.57          | 220      |            |   |            |   |                                      |   |        |                                      | -               | 1   |                  |     |                    | + | 1                     |  |
| 214)           |   |  |   |          | 2   |               | 1.18     |            |   | 14.        |   |                                      |   |        |                                      |                 |     |                  | +   | 1                  | + | 4                     |  |
| 3214)          |   |  |   |          |     |               |          | Q          |   |            |   |                                      |   |        |                                      |                 | +   | 1                | +   | 2                  | + | 6                     |  |
| $2^{2}1^{3}$ ) |   | 110                                    |   |          |     |               | 238      | 44 1       |   | 1          |   |                                      |   |        | +                                    | 1               | +   | 2                | +   | 5                  | + | 12                    |  |
| $2^{4}1^{2}$ ) |   | 61,00                                  |   |          |     |               | 108      | 40.2       |   | Cart       |   |                                      | + | 1      | +                                    | 4               | +   | 6                | +   | 12                 | + | 24                    | + 2  |
| (416)          |   |  |   | 0.5      | N.  |               | NB       |            |   | 16.6       | + | 1                                    |   |        |                                      |                 |     |                  | +   | 6                  | + | 25                    | ·  |
| 3215)          |   | 100                                    |   |          |     |               |          | N. P.      | + | 1          | + | 3                                    |   |        | +                                    | 5               | +   | 11               | +   | 28                 | + | 70                    |  |
| 2314)          |   | 124                                    |   | 41.      | P   |               |          | + 1        | + | 3          | + | 6                                    | + | 4      | +                                    | 19              | +   | 30               | +   | 63                 | + | 132                   | + 6  |
| (317)          | 2423                                    | 1996                                   |   |          | 1   | +             | 1        |            | + | 7          | + | 22                                   |   |        | +                                    | 21              | +   | 42               | +   | 112                | + | 280                   |  |
| 2216)          |   | 1.61                                   | - |          | 1   | +             | 2        | + 6        |   | 20         | + | 42                                   | + | 15     | +                                    | 72              | +   | 115              | +   | 242                | + | 510                   | + 20   |
| (218)          |   |  | 1 | +        | 8   | +             | 17       | + 28       |   |            | + | 192                                  | + | 56     |                                      | 252             | +   | 392              | +   | 812                |   | 1680                  | + 70   |
| (110)          | +1                                      | + 10                                   | 0 | + 4      | 5   | +             | 90       | + 120      | + | 360        | + | 720                                  | + | 210    | +                                    | 840             | +   | 1260             | +   | 2520               | + | 5040                  | +252   |

X (a). Runs on to p. 436.

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|                                    |        | 45<br>ef |     | 235             |      | 1235<br>52df  |     | $12^{25}$<br>$bc^{2}f$ |   | $1^{3}25$<br>$b^{3}cf$ |      | $\begin{bmatrix} 1^55\\b^5f \end{bmatrix}$ | i | $24^2$<br>$ce^2$ |   | $1^{2}4^{2}$<br>$b^{2}e^{2}$ | 30 | ${3^24\over d^2e}$ |      | 1234<br>bcde |
|------------------------------------|--------|----------|-----|-----------------|------|---------------|-----|------------------------|---|------------------------|------|--|---|------------------|---|------------------------------|----|--------------------|------|--------------|
| (10)                               |        |          | -   |                 |      |               |     |                        |   |                        |      |  |   | -                |   |                              | 12 |                    |      | 11110        |
| (91)                               | 1      | 10       |     |                 |      |               |     |                        |   |                        |      |  |   |                  | 1 |                              | -  | -                  |      | 15           |
| (82)                               |        |          | 1   |                 |      | 1             |     |                        | 1                                       |                        |      |  |   |                  |   |                              |    |                    |      | 18           |
| (73)                               | -      |          |     |                 |      |               |     |                        | 1                                       | 19                     |      |  |   |                  |   |                              |    |                    |      | 1            |
| (64)                               |        |          |     |                 |      |               |     | 10                     |   |                        |      |  | 1 |                  | _ |                              |    |                    |      |              |
| $(5^2)$                            |        |          | _   |                 |      |               |     |                        |   | -                      |      | 10. 1.                                     | - |                  |   |                              | _  | -                  |      |              |
| $(81^2)$<br>(721)                  |        |          |     | 11              |      |               | -   |                        | 3                                       |                        | -    |  | - |                  |   |                              |    |                    |      |              |
| (631)                              |        |          | -   |                 |      |               | _   |                        |   |                        |      |  |   |                  |   |                              | -  |                    | -1-1 |              |
| (541)                              |        |          | -   |                 |      |               | -   |                        |   |                        |      |  |   |                  |   |                              | -  |                    |      |              |
| $(62^2)$                           | - Ales |          | -   | Concernanter of | -    |               |     |                        |   |                        |      |  |   |                  |   |                              | -  |                    | -    |              |
| (532)                              | -      |          | -   |                 |      |               | -   |                        |   |                        | -    |  |   |                  |   |                              | -  |                    |      |              |
| (422)                              | -      |          | -   | The second      | 1    |               |     |                        | -                                       |                        | -    |  | - |                  | - |                              |    |                    | -    |              |
| (432)                              |        |          |     |                 |      |               | -   |                        | 1                                       |                        |      |  |   |                  | - | 1                            | -  |                    |      | 1            |
| (713)                              | -      |          |     |                 |      |               |     |                        | -                                       |                        |      |  |   |                  |   |                              | 1  |                    |      |              |
| $(621^2)$                          | - 21   | 1        | 9   | ~ 11            |      |               | -   |                        |   |                        |      |  |   |                  |   |                              |    |                    |      | 170          |
| $(531^2)$                          |        |          | 1   |                 |      |               |     |                        |   |                        |      |  |   |                  |   |                              |    |                    |      |              |
| $(4^21^2)$                         |        |          | 1   |                 |      |               |     |                        |   |                        |      |  |   |                  |   |                              |    |                    |      |              |
| (5221)                             |        | 3        |     |                 |      |               |     |                        |   |                        |      |  |   |                  |   |                              |    |                    |      |              |
| (4321)                             | -      |          | 7 - |                 |      |               |     |                        |   |                        |      |  |   |                  | 1 |                              |    |                    | +    | 1            |
| (331)                              |        |          | 1   |                 |      | 1             |     |                        | -                                       |                        |      |  |   |                  |   |                              | +  | 1                  | +    | 3            |
| $(42^3)$                           |        |          |     |                 |      |               |     | 1                      |   |                        |      | To Barton                                  |   |                  | + | 1                            | _  |                    | +    | 3            |
| $(3^22^2)$                         |        |          |     |                 |      |               |     |                        | -                                       |                        |      |  | + | 1                | + | 2                            | +  | 2                  | +    |              |
| (614)                              |        |          | -   | 1               |      |               |     | •                      |   |                        | +    | $\frac{1}{5}$                              | _ |                  |   |                              |    | •••                | -    |              |
| $(521^3)$<br>$(431^3)$             |        |          |     |                 |      |               | -   | 1                      | +                                       | $\frac{1}{3}$          | +    | $\frac{3}{10}$                             |   |                  |   |                              | _  |                    |      | 3            |
| $(431^{\circ})$<br>$(42^{2}1^{2})$ |        |          |     |                 | -    | 1             | + + | 2                      | +++++++++++++++++++++++++++++++++++++++ | 7                      | ++++ | 20   | - |                  | + | 2                            | -  |                    | ++++ | 8            |
| $(3^221^2)$                        |        |          | +   | 1               | ++++ | $\frac{1}{2}$ | +   | 5                      | +                                       | 12                     | +    | 30   | + | 2                | + | 4                            | +  | 5                  | +    | 21           |
| (3231)                             | +      | 1        | +   | 3               | +    | 7             | +   | 12                     | +                                       | 27                     | +    | 60   | + | 7                | + | 16                           | +  | 12                 | +    | 49           |
| $(2^{5})$                          | +      | 5        | +   | 10              | +    | 20            | +   | 30                     | +                                       | 60                     | +    | 120  | + | 20               | + | 45                           | +  | 30                 | +    | 110          |
| (515)                              |        |          |     |                 | -    |               | -   |                        | +                                       | 5                      | +    | 26   | - |                  | - |                              | -  |                    | -    |              |
| (4214)                             |        |          | -   |                 | +    | 4             | +   | 9                      | +                                       | 32                     | +    | 95   | - | ·                | + | 6                            | -  |                    | +    | 22           |
| $(3^21^4)$                         | 1819   |          | +   | 4               | +    | 8             | +   | 22                     | +                                       | 54                     | +    | 140  | + | 6                | + | 12                           | +  | 12                 | +    | 56           |
| $(32^{2}1^{3})$                    | +      | 3        | +   | . 11            | +    | 26            | +   | 48                     | +                                       | 112                    | +    | 260  | + | 18               | + | 42                           | +  | 31                 | +    | 128          |
| $(2^41^2)$                         | +      | 14       | +   | 32              | +    | 68            | +   | 108                    | +                                       | 228                    | +    | 480  | + | 53               | + | 114                          | +  | 80                 | +    | 284          |
| (416)                              | 00     |          | 8   |                 | +    | 15            | +   | 30                     | +                                       | 111                    | +    | 330  |   |                  | + | 20                           |    |                    | +    | 60           |
| (3215)                             | +      | 10       | +   | 35              | +    | 85            | +   | 156                    | +                                       | 368                    | +    | 860  | + |                  | + | 120                          | +  |                    | +    | 335          |
| $(2^{3}1^{4})$                     | +      | 42       | +   | . 99            | +    | 210           | +   | 339                    | +                                       | 720                    | +    | 1530                                       | + | 144              | + | 306                          | +  |                    | +    | 735          |
| (317)                              | +      | 35       | +   | 105             | +    | 266           | +   | 462                    | +                                       | 1092                   | +    | 2520                                       | + | 140              | + | 350                          | +  |                    | +    | 875          |
| $(2^21^6)$                         | +      | 130      | +   | 296             | +    | 622           | +   | 990                    | +                                       | 2082                   | +    | 4380                                       | + |                  | + | 840                          | +  |                    | +    | 1900         |
| $(21^8)$                           | +      | 406      | +   | 868             |      | 1792          |     | 2772                   | +                                       | 5712                   | +    | 11760                                      |   | 1120             |   | 2310                         |    | 1540               | +    | 4900         |
| $(1^{10})$                         | +      | 1260     | +   | 2520            | +    | 5040          | +   | 7560                   | +                                       | 15120                  | +    | 30240                                      | + | 3150             | + | 6300                         | +  | 4200               | +    | 12600        |

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OF THE ROOTS OF AN EQUATION,

| 1³34<br>b³de |   | $2^{3}4$<br>$c^{3}e$ |     | $1^{2}2^{2}4$<br>$b^{2}c^{2}e$ |      | 1 <sup>4</sup> 24<br>b <sup>4</sup> ce |   | $1^{6}4$<br>$b^{6}e$ |   | $13^3$<br>$bd^3$ |   | $2^{2}3^{2}$<br>$c^{2}d^{2}$ |   | $1^{\frac{9}{2}}23^{\frac{9}{2}}$<br>$b^{2}cd^{\frac{9}{2}}$ |   | $\frac{1^4 3^2}{b^4 d^2}$ |   | $12^{3}3$<br>$bc^{3}d$ |
|--------------|---|----------------------|-----|--------------------------------|------|--|---|----------------------|---|------------------|---|------------------------------|---|--|---|---------------------------|---|------------------------|
|              |   | 1013                 |     | 1 4 20                         |      |  |   |                      |   |                  |   |                              |   |  |   |                           |   | - 390                  |
|              |   | 1019                 | 1   |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           | - |                        |
|              | - |                      |     |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           |   | 1 200 0                |
|              |   |                      | 130 |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           | 1 | 5.5.6                  |
|              |   |                      | -   |                                |      |  |   |                      | - |                  |   |                              |   |  |   |                           | - |                        |
|              |   |                      | -   |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           | - | -                      |
|              |   |                      | -   |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           |   |                        |
|              |   |                      |     |                                |      |  |   |                      |   |                  |   |                              |   |  |   |                           |   |                        |
|              |   |                      | -   |                                | 192. |  |   |                      |   |                  |   |                              |   |  |   |                           | + | 1                      |
|              |   |                      | -   |                                |      |  | - |                      |   |                  |   |                              |   |  | + | 1                         | T |                        |
|              |   |                      | -   | 00.1                           |      |  |   |                      |   |                  |   |                              | + | 1  | + | 4                         | + |                        |
|              |   | 1101.                | -   | Tiber I                        | ·    |  |   |                      |   |                  | + | T                            | + | $\frac{1}{2}$  | + | 6                         | + | 7                      |
|              |   | 1010                 |     | P.M.L. 171                     |      |  |   |                      | + | 1                | + | $\frac{1}{2}$                | + | 5  | + | 12                        | + | 12                     |
|              |   | 1014                 | 10  | 1.1                            |      |  | + | 1                    |   |                  | - |                              | - |  |   |                           |   |                        |
|              |   | 3012                 | 100 |                                | +    | 1                                      | + | 6                    |   |                  |   |                              |   |  | + | 2                         |   |                        |
|              | - | 1.80 1.              | +   | 1                              | +    | 4                                      | + | 15                   | - |                  |   |                              | + | 2  | + | 8                         | + | 7                      |
|              | + | 1                    | +   | 2                              | +    | 6                                      | + | 20                   |   |                  | + | 2                            | + | 4  | + | 12                        | + | 16                     |
| + 1          |   |                      | +   | 2                              | +    | 9                                      | + | 30                   |   |                  | - |                              | + | 5  | + | 22                        | + | 15                     |
| + 3          | + | 3                    | +   | 8                              | +    | 22                                     | + | 60                   | + | 3                | + | 8                            | + | 21   | + | 56                        | + | 49                     |
| + 6          | + | 6                    | +   | 15                             | +    | 36                                     | + | 90                   | + | 10               | + | 18                           | + | 42   | + | 96                        | + | 81                     |
| + 10         | + | 6                    | +   | 18                             | +    | 48                                     | + | 120                  | + | 6                | + | 15                           | + | 42   | + | 115                       | + | 87                     |
| + 18         | + | 15                   | +   | 34                             | +    | 78                                     | + | 180                  | + | 18               | + | 34                           | + | 80   | + | 188                       | + | 156                    |
|              | - |                      | 0   |                                | +    | 4                                      | + | 25                   |   |                  |   |                              | - |  | + | 6                         | / |                        |
| + 3          | - |                      | +   | 7                              | +    | 32                                     | + | 111                  |   |                  | - |                              | + | 12   | + | 54                        | + | 27                     |
| + 9          | + | 10                   | +   | 27                             | +    | 76                                     | + | 215                  | + | 6                | + | 18                           | + | 48   | + | 132                       | + | 112                    |
| + 27         | + | 18                   | +   | 54                             | +    | 149                                    | + | 390                  | + | 15               | + | 34                           | + | 99   | + | 270                       | + | 198                    |
| + 48         | + | 42                   | +   | 99                             | +    | 236                                    | + | 570                  | + | 42               | + | 80                           | + | 186  | + | 436                       | + | 358                    |
| + 112        | + | 87                   | +   | 198                            | +    | 450                                    | + | 1020                 | + | 87               | + | 156                          | + | 358  | + | 820                       | + | 645                    |
| + 240        | + | 180                  | +   | 390                            | +    | 840                                    | + | 1800                 | + | 180              | + | 310                          | + | 680  | + | 1500                      | + | 117(                   |
| + 10         |   |                      | +   | 20                             | +    | 95                                     | + | 330                  |   |                  |   |                              | + | 30   | + | 140                       | + | 60                     |
| + 76         |   | 48                   | +   | 149                            | +    | 416                                    | + | 1095                 | + | 36               | + | 78                           | + | 236  | + | 650                       | + | 450                    |
| + 132        | + | 115                  | +   | 270                            | +    | 650                                    | + | 1580                 | + | 96               | + | 188                          | + | 436  | + | 1032                      | + | 820                    |
| + 294        | + | 228                  | +   | 523                            | +    | 1196                                   | + | 2730                 | + | 210              | + | 370                          | + | 844  | + | 1920                      | + | 1479                   |
| + 612        | + | 468                  | +   | 1008                           | +    | 2172                                   | + | 4680                 | + | 444              | + | 740                          | + | 1604   | + | 3480                      | + | 2688                   |
| + 215        | + | 120                  | +   | 390                            | +    | 1095                                   | + | 2850                 | + | 90               | + | 180                          | + | 570  | + | 1580                      | + | 1020                   |
| + 775        | + | 585                  | +   | 1340                           | +    | 3050                                   | + | 6900                 | + | 510              | + | 880                          | + | 2000   | + | 4520                      | + | 3390                   |
| + 1566       | + | 1194                 | +   | 2547                           | +    | 5436                                   | + | 11610                | + | 1092             | + | 1776                         | + | 3792   | + | 8100                      | + | 6180                   |
| + 2030       | + | 1470                 | +   | 3360                           | +    | 7560                                   | + | 16800                | + | 1260             | + | 2100                         | + | 4760   | + | 10640                     | + | 777(                   |
| + 3990       |   | 3015                 | +   | 6330                           |      | 13290                                  | + | 27900                | + | 2700             | + | 4280                         | + | 8980   | + | 18840                     |   | 14220                  |
| + 10080      |   | 7560                 |     | 15540                          |      | 31920                                  | + | 65520                | + | 6720             |   |                              |   | 21280  | + | 43680                     |   | 32760                  |
| + 25200      | + | 18900                | +   | 37800                          | +    | 75600                                  | + | 151200               | + | 16800            | + | 25200                        | + | 50400  | + | 100800                    | + | 75600                  |

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|  |             | 100 | ${1^{3}2^{2}3} \ b^{3}c^{2}d$ |   | $1^{5}23$<br>$b^{5}cd$ |       | $\begin{array}{c} 1^73\\b^7d\end{array}$  |    | $2^5 c^5$ |          | $2^2 3^2 \\ b^2 c^4$ |   | ${142^3\over b^4c^3}$  |   | ${1^{6}2^{2}\over b^{6}c^{2}}$ |   | $1^{8}2$<br>$b^{8}c$ |   | 1 <sup>10</sup><br>B <sup>10</sup> |
|--|-------------|-----|-------------------------------|---|------------------------|-------|---|----|-----------|----------|----------------------|---|--|---|--------------------------------|---|----------------------|---|------------------------------------|
|  | (10)        |     |                               |   |                        |       |   | -  |           | _        |                      |   |  |   |                                |   |                      | + | 1                                  |
|  |             |     |                               |   |                        |       |   |    | 11        |          |                      |   |  |   |                                | + |                      | + |                                    |
|  |             | -   |                               |   |                        |       |   |    | je.       | 1        | 4                    |   |  | + |                                | + |                      | + |                                    |
|  |             |     |                               |   |                        |       |   |    | 1. Second |          |                      | + | 1  | + |                                | + |                      | + |                                    |
|  |             |     |                               |   |                        |       |   |    |           | +        |                      | + |  | + |                                | + |                      | + |                                    |
|  |             |     |                               |   |                        |       |   | +  | 1         | +        | 2                    | + | 6  | + |                                | + |                      | + |                                    |
|  |             |     |                               |   |                        | +     |   |    |           |          |                      |   |  | + | 2                              | + |                      | + |                                    |
|  |             |     |                               | + |                        | +     | 2   |    |           |          |                      | + |  | + |                                | + |                      | + |                                    |
|  |             | +   |                               | + | 5                      | +     |   |    |           | +        | 4                    | + | 19   | + |                                | + |                      | + | and the second second              |
|  |             | +   | and the second second second  | + |                        | +     | and the second se | +  | 5         | +        | 14                   | + | 42   | + | 130                            | + | 406                  | + |                                    |
|  |             | +   |                               | + |                        | +     |   |    |           | +        |                      | + |  | + |                                | + |                      | + |                                    |
|  |             | +   |                               | + |                        | +     |   | +  |           | +        | 32                   | + | 99   | + |                                | + | 868                  | + |                                    |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$  |             | +   |                               | + |                        | +     |   | +  | 20        | +        | 53                   | + | 144  | + | 400                            | + | 1120                 | + |                                    |
|  |             | +   | 31                            | + |                        | +     |   | +  | 30        | +        | 80                   | + | 213  | + | 570                            | + | 1540                 | + |                                    |
|  | $(71^3)$    | 1.  |                               | + | 3                      | +     | 22  |    |           |          |                      | + | 6  | + | 42                             | + | 192                  | + |                                    |
| $ \begin{array}{c} (4^{9}1^{9}) \\ + & 42 \\ + & 120 \\ + & 48 \\ + & 156 \\ + & 462 \\ + & 30 \\ + & 114 \\ + & 108 \\ + & 339 \\ + & 990 \\ + & 2772 \\ + & 7560 \\ + & 840 \\ + & 2310 \\ + $   | $(621^2)$   | +   | 5                             | + | 28                     | +     | 112   | -  |           | +        | 12                   | + | 63   | + | 242                            | + | 812                  | + |                                    |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$  | $(531^2)$   | +   | 26                            | + | 85                     | +     | 266   | +  | 20        | +        | 68                   | + | 210  | + | 622                            | + | 1792                 | + |                                    |
| $\begin{array}{c} (52^21) \\ + & 48 \\ + & 128 \\ + & 335 \\ + & 875 \\ + & 110 \\ + & 284 \\ + & 735 \\ + & 1900 \\ + & 1900 \\ + & 4100 \\ + & 1192 \\ + & 300 \\ + & 775 \\ + & 2030 \\ + & 244 \\ + & 132 \\ + & 510 \\ + & 1680 \\ + & 5712 \\ + & 1680 \\ + & 5712 \\ + & 1510 \\ + & 1680 \\ + & 5712 \\ + & 1510 \\ + & 1680 \\ + & 5712 \\ + & 1510 \\ + & 1680 \\ + & 5712 \\ + & 1510 \\ + & 1680 \\ + & 5712 \\ + & 1510 \\ + & 1680 \\ + & 2520 \\ + & 2520 \\ + & 2523 \\ + & 1340 \\ + & 3360 \\ + & 3360 \\ + & 390 \\ + & 1770 \\ + & 1170 \\ + & 2688 \\ + & 1604 \\ + & 3792 \\ + & 8980 \\ + & 12280 \\ + & 5260 \\ + & 5540 \\ + & 13780 \\ (2^9) \\ + & 2580 \\ + & 5710 \\ + & 12600 \\ + & 260 \\ + & 860 \\ + & 2520 \\ + & 1170 \\ + & 12600 \\ + & 2712 \\ + & 480 \\ + & 1530 \\ + & 4380 \\ + & 11760 \\ + & 32760 \\ + & 7560 \\ (3^{21}) \\ + & 1920 \\ + & 4520 \\ + & 1196 \\ + & 1720 \\ + & 27720 \\ + & 4530 \\ + & 9876 \\ + & 21564 \\ + & 47160 \\ + & 103320 \\ + & 21680 \\ (4^{19}) \\ + & 2730 \\ + & 6900 \\ + & 16800 \\ + & 1800 \\ + & 1800 \\ + & 1800 \\ + & 1800 \\ + & 18100 \\ + & 18840 \\ + & 41610 \\ + & 27800 \\ + & 65220 \\ + & 13760 \\ + & 32820 \\ + & 10800 \\ + & 21664 \\ + & 103320 \\ + & 216680 \\ + & 10320 \\ + & 28280 \\ + & 60480 \\ + & 10080 \\ + & 21664 \\ + & 40150 \\ + & 28280 \\ + & 6120 \\ + & 103200 \\ + & 28280 \\ + & 6120 \\ + & 10320 \\ + & 28280 \\ + & 60480 \\ + & 10080 \\ + & 21664 \\ + & 103320 \\ + & 21680 \\ + & 433440 \\ + & 887040 \\ + & 181440 \\ \end{array}$  | $(4^21^2)$  | +   | 42                            | + | 120                    | +     | 350   | +  | 45        | +        | 114                  | + | 306  | + | 840                            | + | 2310                 | + | 6300                               |
| $ \begin{array}{c} (4321) \\ (3^{3}1) \\ + \\ 128 \\ + \\ 210 \\ + \\ 510 $  | $(52^{2}1)$ | +   | 48                            | + | 156                    | +     | 462   | +  | 30        | +        | 108                  | + | 339  | + |                                | + |                      | + | 7560                               |
| $            \begin{array}{ c c c c c c c c c c c c c c c c c c c$   | 4321)       | +   | 128                           | + | 335                    | +     | 875   | +  | 110       | +        | 284                  | + | 735  | + |                                | + |                      | + | 12600                              |
| $ \begin{array}{c} (42^{9}) \\ (42^{9}) \\ + \\ 23^{9}2^{9} \\ + \\ 370 \\ + \\ 370 \\ + \\ 370 \\ + \\ 380 \\ + \\ 2100 \\ + \\ 210 \\ + \\ 210 \\ + \\ 2100 \\ + \\ 210 \\ + \\ 2100 \\ + \\ 310 \\ + \\ 740 \\ + \\ 176 \\ + \\ 190 \\ + \\ 1176 \\ + \\ 1194 \\ + \\ 3015 \\ + \\ 4280 \\ + \\ 1036 \\ + \\ 4280 \\ + \\ 1036 \\ + \\ 2520 \\ + \\ 2580 \\ + \\ 2520 \\ + \\ 2580 \\ + \\ 2520 \\ + \\ 2580 \\ + \\ 2580 \\ + \\ 2520 \\ + \\ 258$  | $(3^{3}1)$  | +   | 210                           | + | 510                    | +     | 1260  | +  | 180       | +        |                      | + |  | + |                                | + |                      | + | 16800                              |
|  | $(42^3)$    | +   | 228                           | + | 585                    | +     | 1470  | +  | 180       | +        |                      |   |  |   |                                |   |                      | + | 18900                              |
|  | $(3^22^2)$  | +   | 370                           | + | 880                    | +     | 2100  | +  | 310       | +        |                      |   |  | + |                                | + |                      | + | 25200                              |
|  | (614)       | +   | 12                            | + | 70                     | +     | 280   |    |           | +        |                      | + |  |   |                                | + |                      | + | 5040                               |
| $ \begin{array}{c} (431^{3}) \\ (42^{2}1^{2}) \\ (41^{2}) \\ (42^{2}1^{2}) \\ (41^{2}) \\ (42^{2}1^{2}) \\ (41^{2}) \\ (42^{2}1^{2}) \\ (4$   |             | +   |                               | + |                        |       |   | +  |           |          |                      |   |  |   |                                |   |                      |   | 15120                              |
| $\begin{array}{c} (42^{2}1^{2}) \\ (42^{2}1^{2}) \\ + \\ 523 \\ + \\ 844 \\ + \\ 2000 \\ (3^{2}1^{2}) \\ + \\ 844 \\ + \\ 2000 \\ + \\ 4760 \\ + \\ 4760 \\ + \\ 680 \\ + \\ 1604 \\ + \\ 1604 \\ + \\ 3792 \\ + \\ 8980 \\ + \\ 2547 \\ + \\ 8980 \\ + \\ 21280 \\ + \\ 21280 \\ + \\ 21280 \\ + \\ 50400 \\ + \\ 50400 \\ + \\ 50400 \\ + \\ 113400 \\ (51^{5}) \\ + \\ 2580 \\ + \\ 2580 \\ + \\ 5700 \\ + \\ 1260 \\ + \\ 860 \\ + \\ 2520 \\ + \\ 1260 \\ + \\ 2520 \\ + \\ 120 \\ + \\ 2580 \\ + \\ 2520 \\ + \\ 120 \\ + \\ 480 \\ + \\ 1080 \\ + \\ 4530 \\ + \\ 10080 \\ + \\ 22500 \\ + \\ 50400 \\ + \\ 14220 \\ + \\ 22500 \\ + \\ 50400 \\ + \\ 113400 \\ + \\ 113400 \\ (421^{4}) \\ + \\ 1196 \\ + \\ 3050 \\ + \\ 7610 \\ + \\ 1720 \\ + \\ 5844 \\ + \\ 12720 \\ + \\ 27720 \\ + \\ 4530 \\ + \\ 9876 \\ + \\ 21564 \\ + \\ 47160 \\ + \\ 12720 \\ + \\ 2820 \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 302400 \\ (2^{3}1^{4}) \\ + \\ 13212 \\ + \\ 28260 \\ + \\ 60480 \\ + \\ 10080 \\ + \\ 1800 \\ + \\ 4680 \\ + \\ 10080 \\ + \\ 12720 \\ + \\ 28260 \\ + \\ 62520 \\ + \\ 137760 \\ + \\ 302400 \\ (2^{3}1^{4}) \\ + \\ 13212 \\ + \\ 28260 \\ + \\ 60480 \\ + \\ 10080 \\ + \\ 1800 \\ + \\ 4680 \\ + \\ 10080 \\ + \\ 21564 \\ + \\ 46152 \\ + \\ 98820 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 181400 \\ (2^{21^{6})} \\ + \\ 29820 \\ + \\ 62520 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 604800 \\ (2^{21^{6})} \\ + \\ 29820 \\ + \\ 62520 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 1814400 \\ \end{array}$   |             | +   |                               | + |                        | +     |   | +  |           | +        |                      |   |  |   |                                |   |                      |   | 25200                              |
| $ \begin{array}{c} (3^{2}21^{2}) \\ + 844 \\ + 2000 \\ (32^{3}) \\ + 1479 \\ + 3390 \\ + 7770 \\ + 1170 \\ + 2688 \\ + 6180 \\ + 10080 \\ + 22500 \\ + 2580 \\ + 2580 \\ + 5700 \\ + 12600 \\ + 2040 \\ + 4530 \\ + 10080 \\ + 22500 \\ + 2040 \\ + 4530 \\ + 10080 \\ + 22500 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ (51^{9}) \\ + 260 \\ + 860 \\ + 2520 \\ + 120 \\ + 2580 \\ + 2520 \\ + 120 \\ + 480 \\ + 1170 \\ + 2172 \\ + 5436 \\ + 13290 \\ + 31920 \\ + 31920 \\ + 31920 \\ + 31920 \\ + 75600 \\ (32^{14}) \\ + 1920 \\ + 4520 \\ + 10640 \\ + 1500 \\ + 3480 \\ + 8100 \\ + 18840 \\ + 13212 \\ + 29820 \\ + 67200 \\ + 151200 \\ (32^{15}) \\ + 7610 \\ + 1720 \\ + 2730 \\ + 6900 \\ + 16800 \\ + 1800 \\ + 1800 \\ + 4530 \\ + 9876 \\ + 21564 \\ + 47160 \\ + 12720 \\ + 28260 \\ + 62520 \\ + 137760 \\ + 302400 \\ (2^{314}) \\ + 13212 \\ + 28260 \\ + 60480 \\ + 10080 \\ + 10080 \\ + 21564 \\ + 46152 \\ + 98820 \\ + 211680 \\ + 433440 \\ + 887040 \\ + 453600 \\ (2^{21^{6}}) \\ + 29820 \\ + 62520 \\ + 137760 \\ + 282240 \\ + 604800 \\ (2^{21^{6}}) \\ + 29820 \\ + 62520 \\ + 137760 \\ + 282240 \\ + 604800 \\ (2^{21^{6}}) \\ + 29820 \\ + 62520 \\ + 131040 \\ + 22500 \\ + 47160 \\ + 98820 \\ + 207000 \\ + 433440 \\ + 887040 \\ + 1814400 \\ \end{array}$  |             | +   |                               |   |                        |       |   |    |           |          |                      |   | and the second s |   |                                |   |                      |   | 37800                              |
| $ \begin{array}{c} (32^{3}1) \\ (2^{9}) \\ + 2580 \\ + 2580 \\ + 2580 \\ + 2580 \\ + 5700 \\ + 12600 \\ + 12600 \\ + 12600 \\ + 2040 \\ + 4530 \\ + 4530 \\ + 10080 \\ + 22500 \\ + 10080 \\ + 22500 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113400 \\ + 113400 \\ + 22500 \\ + 50400 \\ + 113040 \\ + 22500 \\ + 12720 \\ + 28260 \\ + 62520 \\ + 131040 \\ + 282240 \\ + 604800 \\ + 103320 \\ + 22500 \\ + 47160 \\ + 98820 \\ + 207000 \\ + 433440 \\ + 887040 \\ + 181440 \\ + 181440 \\ $   |             | +   |                               |   |                        |       |   |    |           | -        |                      |   |  |   |                                |   |                      |   | 50400                              |
| $ \begin{array}{c} (2^{6}) \\ + & 2580 \\ (51^{6}) \\ + & 260 \\ + & 860 \\ + & 2520 \\ (421^{4}) \\ + & 1196 \\ + & 3050 \\ (421^{4}) \\ + & 1196 \\ + & 3050 \\ + & 7560 \\ + & 840 \\ + & 120 \\ + & 480 \\ + & 2172 \\ + & 5436 \\ + & 13290 \\ + & 13290 \\ + & 13290 \\ + & 13920 \\ + & 1920 \\ + & 4520 \\ + & 10640 \\ + & 1500 \\ + & 1500 \\ + & 3480 \\ + & 13212 \\ + & 29820 \\ + & 67200 \\ + & 103320 \\ + & 27720 \\ + & 4530 \\ + & 1800 \\ + & 1880 \\ + & 13212 \\ + & 29820 \\ + & 67200 \\ + & 103320 \\ + & 226800 \\ (31^{7}) \\ + & 17220 \\ + & 37800 \\ (31^{7}) \\ + & 17220 \\ + & 37800 \\ + & 82320 \\ + & 12600 \\ (2^{21^{6}}) \\ + & 29820 \\ + & 67200 \\ + & 137760 \\ + & 282240 \\ + & 50400 \\ + & 13040 \\ + & 22500 \\ + & 47160 \\ + & 207000 \\ + & 433440 \\ + & 887040 \\ + & 1814400 \\ \end{array} $  |             | +   |                               | + |                        |       |   | +  |           | +        |                      |   |  |   |                                |   |                      |   | 75600                              |
| $ \begin{array}{c} (51^{5}) \\ (421^{4}) \\ + \\ 1196 \\ + \\ 3050 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1920 \\ + \\ 1080 \\ + \\ 1080 \\ + \\ 1080 \\ + \\ 1080 \\ + \\ 1500 \\ + \\ 1500 \\ + \\ 1500 \\ + \\ 18100 \\ + \\ 18100 \\ + \\ 18100 \\ + \\ 18100 \\ + \\ 18140 \\ + \\ 18140 \\ + \\ 181400 \\ + \\ 181400 \\ + \\ 181400 \\ + \\ 18140 $  |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 113400                             |
| $ \begin{array}{c} (421^4) \\ + & 1196 \\ (3^{214}) \\ + & 1920 \\ + & 4520 \\ (3^{213}) \\ + & 3358 \\ + & 7610 \\ (2^{412}) \\ + & 5844 \\ + & 12720 \\ (4^{19}) \\ + & 2730 \\ (4^{19}) \\ + & 2730 \\ + & 6900 \\ (4^{19}) \\ + & 2730 \\ + & 6900 \\ (4^{19}) \\ + & 2730 \\ + & 6900 \\ (4^{19}) \\ + & 2730 \\ (4^{19}) \\ + & 2730 \\ + & 6900 \\ (4^{10}) \\ + & 2730 \\ + & 6900 \\ (4^{10}) \\ + & 2730 \\ + & 6900 \\ + & 16800 \\ + & 1800 \\ + & 4530 \\ + & 9876 \\ + & 21564 \\ + & 47160 \\ + & 103320 \\ + & 226800 \\ (4^{10}) \\ + & 2730 \\ + & 6900 \\ + & 16800 \\ + & 16800 \\ + & 1800 \\ + & 4680 \\ + & 11610 \\ + & 27900 \\ + & 65520 \\ + & 137760 \\ + & 302400 \\ (32^{15}) \\ + & 17220 \\ + & 37800 \\ + & 82320 \\ + & 12600 \\ + & 27720 \\ + & 60480 \\ + & 10080 \\ + & 27720 \\ + & 60480 \\ + & 131040 \\ + & 282240 \\ + & 604800 \\ (2^{216}) \\ + & 29820 \\ + & 62520 \\ + & 137760 \\ + & 282240 \\ + & 50400 \\ + & 103320 \\ + & 211680 \\ + & 433440 \\ + & 887040 \\ + & 1814400 \\ \end{array}$  |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 30240                              |
| $ \begin{array}{c} (3^{2}1^{4}) \\ + \\ 1920 \\ (3^{2}1^{3}) \\ + \\ 3358 \\ + \\ 7610 \\ (2^{4}1^{2}) \\ + \\ 5844 \\ + \\ 12720 \\ (2^{4}1^{2}) \\ + \\ 5844 \\ + \\ 12720 \\ + \\ 2730 \\ + \\ 6900 \\ + \\ 16800 \\ + \\ 16800 \\ + \\ 1800 \\ + \\ 4530 \\ + \\ 9876 \\ + \\ 21564 \\ + \\ 11610 \\ + \\ 27900 \\ + \\ 65520 \\ + \\ 10320 \\ + \\ 226800 \\ + \\ 103320 \\ + \\ 226800 \\ + \\ 10320 \\ + \\ 226800 \\ (31^{7}) \\ + \\ 17220 \\ + \\ 37800 \\ + \\ 28260 \\ + \\ 60480 \\ + \\ 10080 \\ + \\ 1800 \\ + \\ 4680 \\ + \\ 11610 \\ + \\ 27900 \\ + \\ 65520 \\ + \\ 137760 \\ + \\ 302400 \\ (31^{7}) \\ + \\ 17220 \\ + \\ 37800 \\ + \\ 82320 \\ + \\ 12600 \\ + \\ 27720 \\ + \\ 60480 \\ + \\ 10080 \\ + \\ 21564 \\ + \\ 46152 \\ + \\ 98820 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 181440 \\ + \\ 907200 \\ (21^{8}) \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 181440 \\ - \\ 907200 \\ (21^{8}) \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 181440 \\ - \\ 887040 \\ + \\ 181440 \\ - \\ 907200 \\ (21^{8}) \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 181440 \\ - \\ 907200 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 181440 \\ - \\ 18140 \\$  |             | +   |                               |   |                        |       |   |    |           | -        |                      |   |  |   |                                |   |                      |   | 75600                              |
| $ \begin{array}{c} (32^{2}1^{3}) \\ (2^{4}1^{2}) \\ + \\ 5844 \\ + \\ 12720 \\ (41^{6}) \\ + \\ 2730 \\ + \\ 67610 \\ + \\ 17000 \\ + \\ 17000 \\ + \\ 17000 \\ + \\ 16800 \\ + \\ 1800 \\ + \\ 4530 \\ + \\ 1800 \\ + \\ 4530 \\ + \\ 9876 \\ + \\ 21564 \\ + \\ 11610 \\ + \\ 21564 \\ + \\ 47160 \\ + \\ 103320 \\ + \\ 226800 \\ + \\ 103320 \\ + \\ 226800 \\ + \\ 103320 \\ + \\ 226800 \\ + \\ 103320 \\ + \\ 226800 \\ + \\ 1000 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 1720 \\ + \\ 13760 \\ + \\ 28220 \\ + \\ 131040 \\ + \\ 22500 \\ + \\ 47160 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 1814400 \end{array} $  |             | +   |                               |   |                        |       |   |    |           | -        |                      |   |  |   |                                |   |                      |   | 100800                             |
| $ \begin{array}{c} (2^{41^{2})} \\ (41^{6}) \\ + \\ 2730 \\ + \\ 7610 \\ + \\ 1720 \\ (2^{31^{4})} \\ + \\ 13212 \\ + \\ 28260 \\ (31^{7}) \\ + \\ 17220 \\ (2^{31^{4})} \\ + \\ 13220 \\ + \\ 29820 \\ (31^{7}) \\ + \\ 17220 \\ (2^{31^{6})} \\ + \\ 29820 \\ + \\ 62520 \\ + \\ 131040 \\ + \\ 22500 \\ + \\ 12600 \\ + \\ 22500 \\ + \\ 47160 \\ + \\ 12720 \\ + \\ 28260 \\ + \\ 60480 \\ + \\ 10080 \\ + \\ 21564 \\ + \\ 46152 \\ + \\ 98820 \\ + \\ 211680 \\ + \\ 282240 \\ + \\ 604800 \\ + \\ 10020 \\ + \\ 433440 \\ + \\ 907200 \\ (2^{1^{6})} \\ + \\ 29820 \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 1814400 \\ \end{array} $  |             |     |                               |   |                        | -     |   |    |           |          |                      |   |  |   |                                |   |                      |   | 151200                             |
| $ \begin{array}{c} (41^{6}) \\ + \\ 2730 \\ (321^{5}) \\ + \\ 7610 \\ + \\ 1700 \\ (2^{31^{4}}) \\ + \\ 13212 \\ + \\ 28260 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ (31^{7}) \\ + \\ 17220 \\ + \\ 37800 \\ + \\ 82320 \\ + \\ 12600 \\ + \\ 10080 \\ + \\ 21564 \\ + \\ 46152 \\ + \\ 9820 \\ + \\ 46152 \\ + \\ 98820 \\ + \\ 211680 \\ + \\ 282240 \\ + \\ 604800 \\ + \\ 453600 \\ (2^{21^{6}}) \\ + \\ 29820 \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 1814400 \end{array} $   |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 226800                             |
| $ \begin{array}{c} (321^5) \\ (2^{3}1^4) \\ + 13212 \\ (31^7) \\ (31^7) \\ + 29820 \\ (2^{2}1^6) \\ + 67200 \\ (2^{1}8) \\ + 67200 \\ \end{array} \\ \begin{array}{c} + 17000 \\ + 282240 \\ + 60480 \\ + 10080 \\ + 10080 \\ + 10080 \\ + 21564 \\ + 12720 \\ + 21564 \\ + 46152 \\ + 28260 \\ + 60480 \\ + 131040 \\ + 282240 \\ + 604800 \\ + 131040 \\ + 282240 \\ + 604800 \\ + 07200 \\ + 131040 \\ + 282240 \\ + 50400 \\ + 103320 \\ + 211680 \\ + 433440 \\ + 887040 \\ + 1814400 \\ \end{array} $  |             |     |                               |   |                        | -     |   |    |           |          |                      |   |  |   |                                |   |                      |   | 151200                             |
| $ \begin{array}{c} (2^{3}1^{4}) \\ (31^{7}) \\ (2^{2}1^{6}) \\ (2^{2}1^{6}) \\ (2^{2}1^{8}) \\ (2^{1})$  |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 302400                             |
| $ \begin{array}{c} (31^7) \\ (2^21^6) \\ (2^21^6) \\ + \\ \hline 29820 \\ + \\ 67200 \\ + \\ 137760 \\ + \\ 282240 \\ + \\ 282240 \\ + \\ 50400 \\ + \\ 50400 \\ + \\ 103320 \\ + \\ 211680 \\ + \\ 211680 \\ + \\ 433440 \\ + \\ 887040 \\ + \\ 887040 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 1814400 \\ + \\ 181400 \\ + \\ 1$  |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 453600                             |
| $ \begin{array}{c} (2^{2}1^{6}) \\ (2^{1}^{8}) \\ + & 67200 \\ \end{array} \\ \begin{array}{c} + & 62520 \\ + & 137760 \\ \end{array} \\ \begin{array}{c} + & 131040 \\ + & 22500 \\ + & 282240 \\ \end{array} \\ \begin{array}{c} + & 22500 \\ + & 47160 \\ + & 103320 \\ \end{array} \\ \begin{array}{c} + & 98820 \\ + & 207000 \\ \end{array} \\ \begin{array}{c} + & 207000 \\ + & 433440 \\ + & 887040 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ + & 1814400 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ \end{array} \\ \begin{array}{c} + & 103320 \\ \end{array} \\ \begin{array}{c} + & 211680 \\ + & 433440 \\ \end{array} \\ \begin{array}{c} + & 887040 \\ + & 887040 \\ \end{array} \\ \begin{array}{c} + & 1814400 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ \end{array} \\ \begin{array}{c} + & 1814400 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \begin{array}{c} + & 907200 \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 181440 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \end{array} $ \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \end{array}  \\ \begin{array}{c} + & 18140 \\ \end{array} \\ \end{array} \\ \end{array} |             |     |                               |   |                        |       |   |    |           |          |                      |   |  |   |                                |   |                      |   | 604800                             |
| $(21^{8}) + 67200 + 137760 + 282240 + 50400 + 103320 + 211680 + 433440 + 887040 + 1814400$   |             |     |                               |   |                        | -     |   | -  |           |          |                      |   |  |   |                                |   |                      |   | 907200                             |
|  |             |     |                               |   |                        | 10000 |   | 17 |           | a second |                      | - |  |   |                                |   |                      | + | 1814400                            |
|  |             |     |                               |   |                        | 1.000 |   |    |           |          |                      |   |  |   |                                |   |                      | + | 3628800                            |

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|                                      | 10                | 19   | 28                 | 128              | 37                        | 127               | 1 137           | 46                       | 136               | 226             | 1226             | 146             | 52                       | 145             |
|--------------------------------------|-------------------|--|--------------------|------------------|---------------------------|-------------------|-----------------|--------------------------|-------------------|-----------------|------------------|-----------------|--------------------------|-----------------|
| - 5/6 -                              | k                 | bj   | ci                 | $b^2i$           | dh                        | bch               | $b^{3}h$        | eg                       | bdg               | $c^2g$          | $b^2 cg$         | $b^4g$          | $f^2$                    | bef             |
| (10)                                 | - 10              | + 10   | + 10               | -10              | +10                       | -20               | + 10            | + 10                     | -20               | -10             | + 30             | -10             | + 5                      | -20             |
| (91)                                 | + 10              | -1   | -10                | + 1              | -10                       | + 11              | - 1             | -10                      | + 11              | + 10            | -12              | + 1             | - 5                      | + 11            |
| (82)                                 | + 10              | -10  | + 6                | + 2              | -10                       | + 4               | - 2             | -10                      | + 20              | - 6             | - 6              | + 2             | - 5                      | + 20            |
| (73)                                 | + 10              | -10  | -10                | +10              | + 11                      | - 1               | - 3             | -10                      | -1                | +10             | - 9              | + 3             | - 5                      | + 20            |
| (64)                                 | + 10              | -10  | -10                | + 10             | -10                       | + 20              | - 10            | + 14                     | - 4               | -2              | - 6              | + 4             | - 5                      | - 4             |
| $(5^2)$                              | + 5               | - 5  | - 5                | + 5              | - 5                       | + 10              | - 5             | - 5                      | + 10              | + 5             | -15              | + 5             | + 10                     | -15             |
| $(81^2)$                             | - 10              | + 1  | + 2                | - 1              | + 10                      | - 3               | + 1             | + 10                     | - 11              | - 2             | + 4              | - 1             | + 5                      | - 11            |
| (721)                                | - 20              | + 11   | + 4                | - 3              | - 1                       | - 8               | + 3             | + 20                     | -10               | - 4             | + 11             | - 3             | + 10                     | - 31            |
| (631)                                | - 20              | + 11   | + 20               | - 11             | - 1                       | -10               | + 4             | - 4                      | - 4               | - 8             | + 15             | - 4             | + 10                     | - 7             |
| (541)                                | - 20              | + 11   | + 20               | - 11             | + 20                      | - 31              | + 11            | - 4                      | - 7               | - 8             | + 18             | - 5             | -15                      | + 23            |
| $(62^2)$                             | - 10              | +10  | - 6                | -2               | + 10                      | - 4               | + 2             | - 2                      | - 8               |                 | + 6              | - 2             | + 5                      | - 8             |
| (532)                                | -20               | +20  | + 4                | -12              | -1                        | - 3               | + 5             | + 20                     | -19               | - 4             | +15              | - 5             | -15                      | + 10            |
| $(4^{2}2)$                           | -10               | +10  | + 2                | - 6              | +10                       | -12               | + 6             | -14                      | + 4               | + 10            | - 6              |                 | + 5                      | + 4             |
| $(43^2)$                             | -10               | + 10   | +10                | - 10             | - 11                      | + 1               | + 3             | -2                       | + 13              | - 4             | - 3              |                 | + 5                      | - 8             |
| $(71^3)$                             | + 10              | -1   | - 2                | + 1              | - 3                       | + 3               | - 1             | -10                      | + 4               | + 2             | - 4              | + 1             | - 5                      | + 11            |
| $(621^2)$<br>(531 <sup>2</sup> )     | + 30              | -12  | - 6                | + 4              | - 9                       | + 11              | - 4             | - 6                      | + 15              | + 6             | - 15             | + 4             | -15                      | + 18            |
| $(331^{-})$<br>$(4^{2}1^{2})$        | + 30              | -12  | -22                | +12              | - 9                       | + 13              | - 5             | - 6                      | + 15              | + 10            | - 19             | + 5             | +.10                     | -12             |
| $(4^{-1^{2}})$<br>$(52^{2}1)$        | + 15              | - 6  | - 11               | + 6              | - 15                      | +17               | - 6             | + 9                      | - 3               | - 1             | + 1              |                 | + 5                      | - 8             |
|                                      | + 30              | -21  | + 2                | + 5              | - 9                       | +12               | - 5             | - 18                     | + 18              | + 4             | -17              | + 5             | + 10                     |                 |
| (4321)<br>(3 <sup>3</sup> 1)         | + 60              | -42  | -28                | + 26             | + 3                       | + 21              | -12             | +12                      | -15               | - 8             | + 7              |                 | $\frac{-5}{-5}$          |                 |
| $(3^{1})$<br>$(42^{3})$              | + 10              | -7   | -10                | + 7              | + 11                      | - 4               |                 | + 2                      | - 7               | + 4             |                  |                 |                          | + 5             |
| $(42^{\circ})$<br>$(3^{2}2^{2})$     | + 10              | - 10   | + 6                | + 2              | -10                       | + 4               | - 2             | +10                      |                   | - 4             | + 2              |                 | - 5                      |                 |
| $(5^{-}2^{-})$<br>(61 <sup>4</sup> ) | + 15              | - 15   | + 1                | + 7              | $\frac{+ 6}{+ 3}$         | $\frac{-7}{-3}$   |                 | $\frac{-9}{+4}$          | + 3               | $\frac{+2}{-2}$ |                  | ····<br>1       | +5 + 5                   | - 1             |
| $(521^3)$                            | $\frac{-10}{40}$  | +1 + 13  | + 2                | - 1              | and the second second     |                   | + 1 + 5         |                          | $\frac{-4}{-19}$  | $\frac{-2}{-8}$ | $\frac{+4}{+19}$ | $\frac{-1}{-5}$ | $\frac{+5}{-5}$          | $\frac{-5}{+1}$ |
| $(431^3)$                            | $\frac{-40}{-40}$ | ALL STREET, ST | + 8                | - 5              | + 12                      | -14               |                 |                          |                   |                 |                  |                 | $\frac{-5}{-5}$          |                 |
| $(42^21^2)$                          | $\frac{-40}{-60}$ | +13 + 33   | + 24 + 4           | $\frac{-13}{-9}$ | +12 + 18                  | $\frac{-16}{-23}$ |                 |                          | + 5 + 3           | + 8             | $\frac{-1}{-4}$  |                 |                          | $\frac{+5}{-1}$ |
| $(3^221^2)$                          | $\frac{-60}{-60}$ | +33+33   |                    | $\frac{-9}{-21}$ | $\frac{+10}{-24}$         |                   |                 |                          |                   | $\frac{+8}{-4}$ |                  |                 | + 5 + 5                  | $\frac{-1}{-3}$ |
| (3231)                               | $\frac{-00}{-40}$ | +33+31   | + 28               |                  | $\frac{-24}{-2}$          |                   |                 | + 8                      | $\frac{+ 6}{- 3}$ |                 |                  |                 | $\frac{+}{-}\frac{5}{5}$ |                 |
| $(2^{5})$                            | $\frac{-40}{-2}$  |  | $\frac{-8}{-2}$    |                  |                           |                   |                 | $\frac{+8}{-2}$          |                   |                 |                  |                 | $\frac{-5}{+1}$          | + 1             |
| (515)                                | $\frac{-2}{+10}$  | $\frac{+2}{-1}$  | $\frac{-2}{-2}$    | + 1              | $\frac{+2}{-3}$           | + 3               | ${-1}$          | $\frac{-4}{-4}$          | + 4               | + 2             | - 4              | + 1             | <u> </u>                 |                 |
| (4214)                               | $\frac{+10}{+50}$ | $\frac{-1}{-14}$   | $\frac{-2}{-10}$   |                  | $\frac{-5}{-15}$          | $\frac{+3}{+17}$  | $\frac{-1}{-6}$ | $\frac{-4}{+4}$          | $\frac{+ 4}{- 1}$ | $\frac{+2}{-2}$ | $\frac{-1}{+1}$  | <u>+ 1</u>      |                          |                 |
| (3214)                               | + 25              | $\frac{-14}{-7}$   |                    | $\frac{+6}{+7}$  | $\frac{-10}{+3}$          | $\frac{+11}{-1}$  |                 | $\frac{+}{+}\frac{1}{2}$ | $\frac{-1}{-2}$   | $\frac{-2}{+1}$ | <u>+ 1</u>       |                 |                          |                 |
| $(32^21^3)$                          | $\frac{1}{+100}$  | -46  | $\frac{-13}{-12}$  | + 14             | $\frac{+}{+}\frac{3}{12}$ | $\frac{-1}{-5}$   |                 | $\frac{+2}{-4}$          | $\frac{-2}{+1}$   | <u> </u>        |                  |                 |                          |                 |
| $(2^41^2)$                           | + 25              | $\frac{-40}{-16}$  | $\frac{-12}{+9}$   |                  | $\frac{+12}{-4}$          |                   |                 | $\frac{-1}{+1}$          | <u> </u>          |                 |                  |                 |                          |                 |
| (416)                                | $\frac{1}{-10}$   | $\frac{-10}{+1}$   | $\frac{+ 3}{+ 2}$  | - 1              |                           | - 3               | + 1             | <u> </u>                 |                   |                 |                  |                 |                          |                 |
| (3215)                               | $\frac{10}{-60}$  | $\frac{+1}{+15}$   | $\frac{+ 2}{+ 12}$ | $\frac{-1}{-7}$  | $\frac{+3}{-3}$           | $\frac{-5}{+1}$   |                 |                          |                   |                 |                  |                 |                          |                 |
| $(2^{3}1^{4})$                       | -50               | $\frac{+10}{+20}$  | $\frac{+12}{-6}$   |                  | $\frac{-5}{+1}$           | <u>+ 1</u>        |                 |                          |                   |                 |                  |                 |                          |                 |
| (317)                                | $\frac{-30}{+10}$ | $\frac{+20}{-1}$   | $\frac{-0}{-2}$    | + 1              |                           |                   |                 |                          |                   |                 |                  |                 |                          |                 |
| $(2^21^6)$                           | $\frac{1}{+35}$   | $\frac{-1}{-8}$  | $\frac{-2}{+1}$    |                  |                           |                   |                 |                          |                   |                 |                  |                 |                          |                 |
| (218)                                | $\frac{1}{-10}$   | $\frac{-6}{+1}$  | <u> </u>           |                  |                           |                   | <u> </u>        |                          |                   |                 |                  |                 |                          |                 |
| (110)                                | + 1               |  |                    |                  |                           |                   |                 |                          |                   |                 |                  |                 |                          |                 |
| , , [                                |                   |  |                    |                  |                           |                   |                 |                          |                   |                 |                  |                 |                          |                 |

X (b). Runs on to p. 439.

|             | 235             | $1^{2}35$       | $12^{2}5$ | 1325            | 155      | $24^{2}$        | $1^{2}4^{2}$    | 3°4    | 1234   |                  |            | $1^{2}2^{2}4$ |                   | 164    |
|-------------|-----------------|-----------------|-----------|-----------------|----------|-----------------|-----------------|--------|--------|------------------|------------|---------------|-------------------|--------|
| =           | cdf             | $b^2 df$        | $bc^2f$   | $b^3 cf$        | $b^{5}f$ | ce <sup>2</sup> | $b^2e^2$        | $d^2e$ | bcde   | $b^{3}de$        | $c^3e$     | $b^2c^2e$     | b <sup>4</sup> ce | $b^6e$ |
| (10)        | -20             | + 30            | + 30      | -40             | + 10     | -10             | + 15            | -10    | + 60   | -40              | + 10       | - 60          | + 50              | - 10   |
| (91)        | + 20            | -12             | - 21      | + 13            | - 1      | + 10            | - 6             | +10    | -42    | +13              | -10        | + 33          | - 14              | + 1    |
| (82)        | + 4             | -22             | + 2       | + 8             | - 2      | + 2             | - 11            | +10    | -28    | + 24             | + 6        | + 4           | -10               | + 2    |
| (73)        | - 1             | - 9             | - 9       | + 12            | - 3      | + 10            | -15             | - 11   | + 3    | + 12             | -10        | + 18          | -15               | + 3    |
| (64)        | + 20            | - 6             | - 18      | + 16            | - 4      | -14             | + 9             | - 2    | + 12   | - 8              | + 10       | -12           | + 4               |        |
| $(5^2)$     | -15             | +10             | + 10      | - 5             |          | + 5             | + 5             | + 5    | - 5    | - 5              | - 5        | + 5           |                   |        |
| $(81^2)$    | -12             | +12             | + 5       | - 5             | + 1      | - 6             | + 6             | -10    | + 26   | - 13             | + 2        | - 9           | + 6               | - 1    |
| (721)       | - 3             | + 13            | + 12      | - 14            | + 3      | -12             | + 17            | + 1    | + 21   | -16              | + 4        | - 23          | + 17              | - 3    |
| (631)       | -19             | +15             | + 18      | - 19            | + 4      | + 4             | - 3             | +13    | -15    | + 5              |            | + 3           | - 1               |        |
| (541)       | + 10            | -12             | - 1       | + 1             |          | + 4             | - 8             | - 8    |        | + 5              |            | - 1           |                   |        |
| $(62^2)$    | - 4             | + 10            | + 4       | - 8             | + 2      | + 10            | - 1             | - 4    | - 8    |                  | - 4        | + 8           | -2                |        |
| (532)       | +17             | - 4             | - 13      | + 5             |          | -12             | + 1             | + 1    | + 5    | _ 1              | + 4        | - 2           |                   |        |
| $(4^{2}2)$  | -12             | + 2             | + 2       |                 |          | + 2             | - 3             | + 2    | + 4    |                  | -2         |               |                   |        |
| $(43^2)$    | + 1             | - 3             | + 3       |                 |          | + 2             | + 3             | - 1    | - 3    |                  |            |               |                   |        |
| $(71^3)$    | + 5             | - 5             | - 5       | + 5             | - 1·     | + 6             | - 6             | + 3    | - 12   | + 6              | - 2        | + 9           | - 6               | + 1    |
| $(621^2)$   | +15             | -19             | - 17      | + 19            | - 4      | - 6             | + 1             | - 3    | + 7    | - 1              | + 2        | - 4           | + 1               |        |
| $(531^2)$   | - 4             | + 3             | + 2       | - 1             |          | + 2             | + 2             | - 3    | + 4    | - 2              | - 2        | + 1           | 18.7 296          |        |
| $(4^21^2)$  | + 1             | + 2             | - 1       |                 |          | - 3             | + 3             | + 3    | - 3    |                  | + 1        |               |                   |        |
| $(52^21)$   | -13             | + 2             | + 9       | - 3             |          | + 2             | $\frac{-1}{-3}$ | + 3    | - 3    | + 1              | - 99.0     |               | 10,78             |        |
| (4321)      | + 5             | + 4             | - 3       |                 |          | + 4             |                 | - 3    | + 1    |                  |            | 1             |                   |        |
| $(3^{3}1)$  | - 1             |                 |           |                 |          | $\frac{-2}{-2}$ |                 | + 1    |        |                  | 0.1294042  | 1.100         |                   |        |
| $(42^3)$    | $\frac{+4}{-2}$ | - 2             |           |                 |          |                 | + 1             |        |        |                  |            |               |                   |        |
| $(3^22^2)$  |                 |                 |           | ·               | + 1      | + 1             |                 |        |        |                  | 4.381      |               |                   |        |
| $(61^4)$    | $\frac{-5}{+5}$ | $\frac{+5}{-1}$ | + 5 / - 3 | $\frac{-5}{+1}$ | + 1      |                 |                 |        |        |                  | <u>- H</u> |               | 210397            |        |
| $(521^3)$   |                 | $\frac{-1}{-2}$ |           | + 1             |          |                 |                 |        | -1-+   |                  |            |               |                   |        |
| $(431^3)$   | $\frac{-1}{-2}$ |                 | + 1       |                 |          |                 |                 |        |        |                  |            |               | 1.21.12ml         |        |
| $(42^21^2)$ |                 | + 1             |           |                 | -        | -               |                 |        | 51 31  |                  |            |               |                   |        |
| $(3^221^2)$ | + 1             |                 |           |                 |          | ESU I           |                 |        |        |                  |            | <u></u>       |                   |        |
| 14 4        | -               |                 |           |                 |          |                 |                 |        |        |                  |            | Ca-14         |                   |        |
|             |                 |                 |           |                 | 1.12     |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        | -      |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           | 1 <u>111111</u> |          |                 |                 |        |        | <u>10.1.4444</u> |            |               |                   |        |
|             |                 |                 | 9144      | 17.226          |          |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           | 1035            |          |                 |                 |        | -      |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        | 41.1             |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        |                  |            |               |                   |        |
|             |                 |                 |           |                 |          |                 |                 |        |        |                  |            | 0             |                   |        |
|             |                 | 1.81            |           |                 |          |                 |                 |        |        |                  |            |               |                   |        |
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| 133               |                     |                 |  |                   | 13223            |                    |                |                       |                 | 1423             |             |                  | 110    |
|-------------------|---------------------|-----------------|--|-------------------|------------------|--------------------|----------------|-----------------------|-----------------|------------------|-------------|------------------|--------|
| $bd^3$            | $\frac{c^2d^2}{15}$ | $b^2cd^2$       |  | $bc^{3}d$         | $b^3c^2d$        | $b^{5}cd$          | $b^7d$         | <i>c</i> <sup>5</sup> | $b^2c^4$        | $b^4 c^3$        | <u>b6c2</u> |                  | b10    |
| $\frac{+10}{-7}$  | $+15 \\ -15$        | -60             | +25  | $\frac{-40}{+31}$ | +100<br>- 46     | $\frac{-60}{+15}$  |                |                       | +25 - 16        | -50              | +35 - 8     | $\frac{-10}{+1}$ | + 1    |
| $\frac{-1}{-10}$  |                     | +33 + 28        | $\frac{-7}{-13}$   |                   |                  | $\frac{+10}{+12}$  |                | $\frac{+2}{-2}$       |                 | $\frac{+20}{-6}$ |             | + 1              |        |
| $\frac{-10}{+11}$ |                     | $+ 20 \\ - 24$  | $\frac{-13}{+3}$   |                   |                  | $\frac{+12}{-3}$   |                | $\frac{-2}{+2}$       | $\frac{+9}{-4}$ |                  | + 1         |                  |        |
| $\frac{+11}{+2}$  | $\frac{+6}{-9}$     |                 | $\frac{+3}{+2}$  | $\frac{-2}{+8}$   | $\frac{+12}{-4}$ |                    |                | $\frac{+4}{-2}$       | $\frac{-4}{+1}$ | + 1              |             |                  |        |
| $\frac{+2}{-5}$   | $\frac{-5}{+5}$     | ${+5}$          | <u>+ 4</u><br>   | $\frac{+0}{-5}$   |                  |                    |                | $\frac{-2}{+1}$       | <u> </u>        |                  |             |                  |        |
| + 7               | $\frac{1}{+7}$      | $\frac{1}{-21}$ | + 7  | - 7               | + 14             | ${-7}$             | + 1            | <u>+ 1</u>            |                 |                  |             |                  |        |
| - 4               | - 7                 | + 9             | $\frac{1}{-1}$   | + 5               | - 5              |                    |                |                       |                 |                  |             |                  |        |
| - 7               | + 3                 | + 6             | -2   | $\frac{1}{-3}$    | + 1              | - 01               |                |                       |                 |                  |             |                  |        |
| + 5               | - 1                 | - 3             |  | + 1               | -                | - 199-3            | all a          |                       |                 |                  |             |                  |        |
| + 4               | + 2                 | - 4             | + 1  |                   | 14-1             |                    |                |                       |                 |                  |             |                  |        |
| - 1               | - 2                 | + 1             | 1.01   | 8 40              | N.C.             | IMA                | 110            | 8.3.3                 |                 |                  | 0.3         |                  | 31.14  |
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| · nan             | 2, 110              | eres T.         | Page   |                   | <u></u>          |                    |                |                       | 0               | 57               | -           |                  |        |
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