Project Euler #61: Cyclical figurate numbers

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This problem is a programming version of Problem 61 from projecteuler.net

Triangle, square, pentagonal, hexagonal, heptagonal, and octagonal numbers are all figurate (polygonal) numbers and are generated by the following formulae:

$$\begin{array}{lll} \text{Triangle} & P_{3,n} = \dfrac{n \times (n+1)}{2} & 1, 3, 6, 10, 15, \cdots \\ \text{Square} & P_{4,n} = n^2 & 1, 4, 9, 16, 25, \cdots \\ \text{Pentagon} & P_{5,n} = \dfrac{n \times (3n-1)}{2} & 1, 5, 12, 22, 35, \cdots \\ \text{Hexagon} & P_{6,n} = n \times (2n-1) & 1, 6, 15, 28, 45, \cdots \\ \text{Heptagon} & P_{7,n} = \dfrac{n \times (5n-3)}{2} & 1, 7, 18, 34, 55, \cdots \\ \text{Octagon} & P_{8,n} = n \times (3n-2) & 1, 8, 21, 40, 65, \cdots \end{array}$$

The ordered set of three 4-digit numbers: 8128, 2882, 8281, has three interesting properties.

- The set is cyclic, in that the last two digits of each number is the first two digits of the next number (including the last number with the first).
- Each polygonal type: triangle $(P_{3,127} = 8128)$, square $(P_{4,91} = 8281)$, and pentagonal $(P_{5,44} = 2882)$, is represented by a different number in the set.
- This is the only set of 4-digit numbers with this property.

You are given a set of numbers $N \in \{3, 4, 5, 6, 7, 8\}$ find the sum of $4 - digit$ numbers from $N - gonal$ sets that respect the above property. If there are multiple such numbers print their sums in sorted order.

Input Format

First line of input contains a number T.
Second line contains set of T numbers each separated by a space.

Constraints

$3 \leq T \leq 6$

Output Format

Print the answer corresponding to the test case.

Sample Input

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3
3 4 5
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Sample Output

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19291
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