Tickets

SEASON 9 – SECOND ROUND

Elon Musk's new intercontinental transportation system has rigorous and complex safety rules. His legal team is of the opinion that the simplest way to legalise everything is to create a whole new country and make every user of the transportation system a citizen of that country.

Every citizen has a **N+1** digit long identification number (ID). The first **N** digits are chosen uniformly at random. The last digit is a checksum, generated with the following formula in respect to the previous digits:

$$X_{n+1} = \left(\left(\prod_{i=1}^{n} a_i x_i^2 + b_i x_i + c_i \right) \bmod 11 \right) \bmod 10$$

Where **x** are the digits of the ID and **a**, **b** and **c** are constants (possibly different for every digit of the ID, thus the index i). The constants are given to you in the input. Elon Musk is very superstitious and he is interested in knowing the **expected** number of people, which he must put in a rocket together, so that every digit (0 to 9) is seen at least once among the checksum digits of their IDs.

Input

From the first line of the input file `tickets.in` **N** is entered. On the next three lines the constants **a**, **b** and **c** are entered.

Output

In the output file `tickets.out` print with absolute error of at most 10^{-6} the expected number of people needed so that every checksum digit is seen at least once among them. **If impossible** for every checksum digit to be generated, print -1.

Constraints

$1 \leq N \leq 25$

Time limit: 0.3 seconds
Memory limit: 256 MB

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Example

Input (tickets.in)	Output (tickets.out)
11 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	29.28968254
7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-1
3 1 2 3 3 2 1 4 2 5	36.60882362