

# Problem CLASS: Class Exercise

The class exercises turned out to be horrible this year. In order to compare the results and marks with class exercises from other schools a statistical analysis will be done. Therefore, the results from a high number of schools are taken into account and the reasons for the bad results were investigated. Are the good students at our school not as intelligent as the good students at other schools? Please help us to write a fast program to evaluate the incredibly high number of results statistically.

As the input is large, we will specify three numbers  $I$ ,  $M$  and  $A$ . You have to reconstruct the results from these numbers yourself: the first result is  $I_1/10$  (in percent), the second result is  $I_2/10$  (in percent), and so on...

$$I_0 = I, \text{ and } I_i = (I_{i-1}^2 \cdot M + A)\%1001$$

## Input

The first line contains the number of results, denoted by  $n$  ( $1 \leq n \leq 99\,999\,999$ ). The next line contains the three integers  $I$ ,  $M$ , and  $A$  ( $0 \leq I, M, A \leq 1\,000$ ). Then the number of queries  $q$  follows in the next line ( $1 \leq q \leq 10\,000$ ). The next  $q$  contain a query as integer  $r$  ( $1 \leq r \leq n$ ).

## Output

If the results are sorted, which percentage would be at rank  $r$ ? Print each value with exactly one position after the decimal point followed by a '%' sign in a single line.

### Sample Input 1

```
10
1 2 3
10
1
2
3
4
5
6
7
8
9
10
```

### Sample Output 1

```
0.5%
5.3%
6.6%
15.7%
25.2%
61.6%
70.3%
70.7%
88.5%
88.9%
```