THICC '17 P2 - Molly and Product

Time limit: 1.0s **Memory limit:** 16M
Python: 128M

Molly has a math addiction. For her birthday, she receives a sequence of length N defined by $A_i = (A_{i-1} \times B) \bmod M$. Given the value of A_0, help Molly find the sum of all pairwise products, mod $10^9 + 7$.

Input Specification

The first and only line of input will contain N, A_0, B, and M, each space-separated.

Output Specification

The output should contain a single integer, the sum of all pairwise products, mod $10^9 + 7$.

Constraints

For all subtasks:

$1 \leq A_0, B, M \leq 10^9$

Subtask 1 [40%]

$1 \leq N \leq 10^3$

Subtask 2 [40%]

$1 \leq N \leq 10^5$

Subtask 3 [20%]

$1 \leq N \leq 10^7$

Sample Input

```
3 6 3 100
```

Sample Output

```
2808
```

Explanation for Sample Output

The three numbers are 6, 18, and 54. Their pairwise products are $6 \times 18 = 108$, $6 \times 54 = 324$, $18 \times 6 = 108$, $18 \times 54 = 972$, $54 \times 6 = 324$ and $54 \times 18 = 972$ and their sum is 2808.