

# THICC '17 P2 - Molly and Product

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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

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

## Output Specification

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

## Constraints

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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

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3 6 3 100
```

## Sample Output

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2808
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## Explanation for Sample Output

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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**.