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Eugene and big number

Problem code: KBIGNUMB

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Read problems statements in [Mandarin Chinese](#), [Russian](#) and [Vietnamese](#) as well.

Eugene has to do his homework. But today, he is feeling very lazy and wants you to do his homework. His homework has the following given maths problem.

You are given three integers: **A**, **N**, **M**. You write the number **A** appended to itself **N** times in a row. Let's call the resulting big number **X**. For example, if **A = 120**, **N = 3**, then **X** will be **120120120**. Find out the value of **X** modulo **M**.

Input

The first line of the input contains an integer **T** denoting the number of test cases. The description of **T** test cases follow.

Each test case is described in one line containing three integers: **A**, **N** and **M** as described in the problem statement.

Output

For each test case, output a single line containing an integer denoting the value of **X** modulo **M**.

Constraints

- $1 \leq T \leq 10^5$
- $0 \leq A \leq 10^9$
- $1 \leq N \leq 10^{12}$
- $2 \leq M \leq 10^9$

Subtasks

Subtask #1 (15 points):

- $0 \leq A \leq 100$
- $1 \leq N \leq 10^5$

Subtask #2 (25 points):

- $1 \leq N \leq 10^9$

Subtask #3 (60 points):

- Original constraints

Example

Input:

```
2
12 2 17
523 3 11
```

Output:

```
5
6
```

Explanation

Example 1: As **A = 12**, **N = 2**, **X = 1212**, **1212 modulo 17 = 5**

Example 2. As **A = 523**, **N = 3**, **X = 523523523**, **523523523 modulo 11 = 6**

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Tester: mgch

Date Added: 5-04-2016

Time Limit: 4 sec

Source Limit: 50000 Bytes

Languages: ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.9.2, CPP14, CS2, D, ERL, FORT, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP disp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYPY, PYTH, PYTH 3.4, RUBY, SCALA, SCM chicken, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

SUBMIT

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