Challenge Accepted!

Little Rubdary has been training a lot for the Mathematics and Informatics Olympiads. She has been studying divisibility, and has come with a new problem for you!

Is there a positive number that is divisible by the first **N** natural numbers? If so, can you find the smallest one?
Can you find the answer to **Q** values of **N**?

You gladly accept this challenge, but with one condition: as the answers may be extremely large, you will show them modulo some number **M**

Input

The first line contains two integer **Q** and **M**, which specify the number of questions to be answered and the modulo respectively. Then, will follow the descriptions of the **Q** questions.

Output

For each question you must print the answer to the challenge modulo **M** in a single line. In case there is no answer to the question, you must output -1

Example

Input:
```
5 990901
1
6
12
20
60
```

Output:
```
1
60
27720
921726
823252
```

Constraints

$1 \leq Q \leq 10^3$
$1 \leq N \leq 3*10^5$
$2 \leq M \leq 10^9$