

Problem K. Fancy Arrays

Input file: *standard input*
Output file: *standard output*
Time limit: 2.5 seconds
Memory limit: 256 mebibytes

Let us fix an integer m . Consider an array a consisting of n positive integers. The array a is *fancy* if each number in a is a divisor of m , and each two neighboring numbers in a are **not** coprime.

Find the total number of fancy arrays of length n . As the answer may be large, find it modulo $10^9 + 7$.

Input

The first line contains two integers, m and q : the number introduced above and the number of queries ($1 \leq m \leq 10^{16}$, $1 \leq q \leq 150$).

Each of the next q lines contains a single integer n ($1 \leq n \leq 10^{18}$).

Output

For each query, print the number of fancy arrays for the given m and n modulo $10^9 + 7$.

Example

<i>standard input</i>	<i>standard output</i>
12 3	6
1	21
2	91
3	