

Number game

Let us play a number manipulation game where the players are given a sequence of distinct positive integers $a[1], a[2], \dots, a[n]$ and a positive integer k . Starting with $a[1]$, the players need to perform at most k moves in order to obtain $a[n]$. At every move, a_i can be changed to a_j ($i \neq j$) if $(6 \times a[i] + a[j])$ is a prime number.

Given a sequence $a[1], a[2], \dots, a[n]$ and two positive integers k and M , let us denote W to be the number of ways to obtain $a[n]$ from $a[1]$ using at most k moves. Your task is to compute the remainder of W when divided by M .

Input

The input file consists of several data sets. The first line of the input file contains the number of data sets which is a positive integer and is not greater than 20. The following lines describe the data sets.

Each data set consists of two lines where the first line contains 3 space-separated integers n, k, M ($n \leq 20; k, M \leq 10^{12}$). The second line contains n space-separated positive integers $a[1], a[2], \dots, a[n]$ ($a[i] \leq 10^9$).

Output

For each data set, write on one line the required remainder.

Example

Input:

1

3 2 100

1 5 7

Output:

2