Problem C
Chocolate

Input File: *testdata.in*
Time Limit: 10 seconds

Problem Description

Mr. Chocker is the chairman of the *Association of Chocolate Manufacturers* (ACM). In order to protect the glorious history of the ACM, Mr. Chocker has to check whether the products from all members of ACM meet the standards every day. The members of the ACM send samples of their products to Mr. Chocker's laboratory before he wakes up, and he must carefully examine every piece of samples one by one.

Today, he wants to make the examination process more complicated and unpredictable. He thinks this would keep his focus on checking the quality of the products. Suppose that there are n samples from the members of ACM, and Mr. Chocker woke up at hh:mm:ss today. Mr. Chocker will process the examination in the following manner:

1. Arrange the samples on a circle and number them $1, 2, \cdots, n$ clockwise.
2. The first sample to be examined is of number hh.
3. If there still exists an unexamined sample after examining the sample of number x, then Mr. Chocker counts unexamined samples clockwise to determine the next sample to be examined:
   - The $(1 + mm^3)$-th sample is the next to be examined if x is odd.
   - The $(1 + ss^3)$-th sample is the next to be examined if x is even.

Your task is to write a program to compute the number of the last examined sample. For example, assume there are 10 samples and Mr. Chocker woke up at 7:00:01. Mr. Chokcer will examine the sample of number 7 first,

then he will examine the samples of numbers 8, 10, 2, 4, 6, 1, 3, 5, 9. So your program should output 9 in this case.

Technical Specifications

1. The number of test cases would be smaller than or equal to 20.
2. The number of samples n would be smaller than 100000 and at least hh.
3. You may assume that $1 \leq hh \leq 12$, $0 \leq mm \leq 59$, and $0 \leq ss \leq 59$.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. Each test case contains four integers n, hh, mm, and ss, separated by spaces.

Output Format

For each test case, output the number of the last sample examined in a line.

Sample Input

```
4
10 7 0 1
10 7 1 2
10 8 2 3
100000 6 17 22
```

Sample Output

```
9
4
5
8567
```