Consider an integer sequence consisting of N elements, where:

$$\begin{aligned} X_0 &= A \\ X_i &= ((X_{i-1} * B + C)\%M) + 1 \qquad \text{for } i = 1 \text{ to } N-1 \end{aligned}$$

You will be given the values of A, B, C, M and N. Find out the number of consecutive subsequences whose sum is a multiple of M.

Consider an example where $A = 2$, $B = 1$, $C = 2$, $M = 4$ and $N = 4$.

So, $X_0 = 2, X_1 = 1, X_2 = 4$ and $X_3 = 3$.

The consecutive subsequences are {2}, {2 1}, {2 1 4}, {2 1 4 3}, {1}, {1 4}, {1 4 3}, {4}, {4 3} and {3}.

Of these 10 'consecutive subsequences', only two of them adds up to a figure that is a multiple of 4 — {1 4 3} and {4}.

Input

The first line of input is an integer T ($T < 500$) that indicates the number of test cases. Eact case consists of 5 integers A, B, C, M and N. A, B and C will be non-negative integers not greater than 1000. N and M will be a positive integers not greater than 10000.

Output

For each case, output the case number followed by the result.

Sample Input

```
2
2 1 2 4 4
923 278 195 8685 793
```

Sample Output

```
Case 1: 2
Case 2: 34
```