

Problem D. The Hash Table

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 512 mebibytes

There is a hash table with m slots, numbered from 0 to $m - 1$. Initially the slots are empty.

There are n elements, numbered from 0 to $n - 1$, which should be inserted into the hash table in this order.

The hash function is $h(x) = x^2 \bmod m$, so the element number i will be inserted into the slot numbered $(i^2 \bmod m)$.

Because of the strange implementation, inserting an element into a slot costs T , where T is the number of elements this slot already contains. Please compute the total cost of inserting all these n elements into the table.

Input

The first line contains an integer t , denoting the number of test cases ($1 \leq t \leq 5$).

Each test case is given on a single line with two integers, n and m ($1 \leq n \leq 10^9$, $2 \leq m \leq 10^9$).

Output

For each test case, print a single line containing the answer.

Example

| standard input | standard output |
|----------------|-----------------|
| 3 | 4 |
| 5 4 | 229 |
| 1234 5678 | 4 |
| 5 4 | |

Note

In the first test case, the elements 0, 1, 2, 3, 4 are inserted into slots 0, 1, 0, 1, 0 respectively, incurring costs of $0 + 0 + 1 + 1 + 2 = 4$.