

Contest Duration: 2025-04-19(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250419T2100&p1=248>) - 2025-04-19(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250419T2240&p1=248>) (local time) (100 minutes)

iso=20250419T2100&p1=248) - 2025-04-19(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250419T2240&p1=248>) (local time) (100 minutes)

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## G - Sum of Prod of Mod of Linear

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Time Limit: 5 sec / Memory Limit: 1024 MiB

Score : 650 points

### Problem Statement

You are given integers  $N, M, A, B_1, B_2$ .

Find  $\sum_{k=0}^{N-1} \{(Ak + B_1) \bmod M\} \{(Ak + B_2) \bmod M\}$ .

There are  $T$  test cases; solve each one.

### Constraints

- $1 \leq T \leq 10^5$
- $1 \leq N \leq 10^6$
- $1 \leq M \leq 10^6$
- $0 \leq A, B_1, B_2 < M$
- All input values are integers.

### Input

The input is given from Standard Input in the following format:

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$T$   
case<sub>1</sub>  
case<sub>2</sub>  
⋮  
case <sub>$T$</sub>

Here, case <sub>$i$</sub>  denotes the  $i$ -th test case.

Each test case is given in the following format:

$N \ M \ A \ B_1 \ B_2$

## Output

Print  $T$  lines. The  $i$ -th line should contain the answer for the  $i$ -th test case.

### Sample Input 1

Copy

```
5
4 7 2 1 4
12 15 2 8 7
777 1 0 0 0
100 101 0 100 100
402 402 4 19 256
```

Copy

### Sample Output 1

Copy

```
27
866
0
1000000
13728568
```

Copy

Consider the first test case.

- When  $k = 0$ :  $\{(2k + 1) \bmod 7\} = 1$ ,  $\{(2k + 4) \bmod 7\} = 4$ .
- When  $k = 1$ :  $\{(2k + 1) \bmod 7\} = 3$ ,  $\{(2k + 4) \bmod 7\} = 6$ .
- When  $k = 2$ :  $\{(2k + 1) \bmod 7\} = 5$ ,  $\{(2k + 4) \bmod 7\} = 1$ .
- When  $k = 3$ :  $\{(2k + 1) \bmod 7\} = 0$ ,  $\{(2k + 4) \bmod 7\} = 3$ .

Hence, the required value is  $1 \times 4 + 3 \times 6 + 5 \times 1 + 0 \times 3 = 27$ . Thus, print 27 on the first line.

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