Problem C: Barycenters

The latest *Math Circles* meeting introduced Alice and Bob to *barycentric coordinates*. In practical terms, it is a technique that makes proofs about concurrency or collinearity of lines much easier. And formally, it is a way of introducing a coordinate system with respect to the vertices of a given fixed triangle. Now for starters, Alice and Bob would like to accomplish something simpler. Given $n \leq 10^5$ points on the plane, they would like to know how many triangles with **distinct** vertices at coordinates $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ can be constructed such that their barycenter – a point with coordinates $(x_1 + x_2 + x_3)/3$ and $(y_1 + y_2 + y_3)/3$ – is an integer point, too. For the purposes of the problem, even if the triangle has zero area, we consider is as a valid triangle.

Input

The input file starts with the number of test cases, T. Then, T test cases follow. Each test case consists of a line containing space-separated integers n, A, B, C, D, x0, y0 and M, where n is the number of points. The coordinates of the points are calculated as follows: $x_0 = x0, y_0 = y0,\ x_i = (A \cdot x_{i-1} + B) \mathrm{mod} M,\ y_i = (C \cdot y_{i-1} + D) \mathrm{mod} M$, $1 \leq i < n$. The parameters are chosen such that the points generated are unique.

Output

Output the line containing `Case C:` , where C is the test case number, starting from 1. Then output an integer standing for the number of triangles with coordinates at three distinct points of the input set, such that their barycenter is a point with integer coordinates.

Sample Input	*Sample Output*
`3`	`Case 1: 1224`
`30 10 11 1 2 77 31 100`	`Case 2: 30`
`10 1 1 1 1 9 0 10`	`Case 3: 17996`
`100 670462 754917 817851 801885 787243 210931 1000000`	