Ichigo and Cubes

HackerRank

Ichigo is receiving special training from Kisuke Urahara to beat Aizen. This time, Kisuke took (P * Q * R) identical cubes and made them into a big box of dimensions $P \times Q \times R$. Moreover, it happened quite by chance that P, Q, R were all pairwise coprime, that is, gcd(P, Q) = gcd(Q, R) = gcd(R, P) = 1 where gcd(X, Y) is the greatest integer dividing both X and Y. He then asked Ichigo to cut the box into two pieces with a single slice. Ichigo used a Getsuga Tenshou in his hollow form on the box and sliced it into two parts completely.

His slice was such that for a corner vertex X of the box, if A, B, C are the vertices of the box adjacent to X, then Ichigo's slice was a plane passing through A, B, C as given in the picture below. Now Kisuke is wondering what is the number of cubes that were cut into two parts. Since the answer can be huge, output it modulo $(10^9 + 7)$.



Input Format:

Line 1: **T** T - Number of test cases. Lines 2 to T+1: **P Q R** P, Q, R - the dimensions of the box

Output Format:

For each test case, print a single integer in a new line that is the number of cubes that were cut by Ichigo modulo $(10^9 + 7)$.

Constraints:

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1 <= T <= 1000
1 <= P, Q, R <= 10<sup>12</sup>
1/2
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P, Q, R are pairwise coprime

Sample Input:

Sample Output:

1 5 15

Explanation:

In the first test case, we have a single cube. And when Ichigo slices it, that single cube is sliced. So, the answer is 1.

In the second test case, we have a $(2 \times 1 \times 3)$ cuboid. Then, when Ichigo takes an arbitrary vertex X and slice the cuboid as explained, then the cube which contains the vertex diagonally(body diagonal) opposite X in the cuboid is not cut, every other cube is cut. So, 5 cubes are cut.