

Problem 1. Polesov and work

Input file: `input.txt`
Output file: `output.txt`
Time limit: 3 seconds
Memory limit: 256 megabytes

Viktor Mikhailovich Polesov, being a true representative of the intelligentsia, is intelligent and fast-thinking. He has recently learned that work of a force is the dot product of the force vector by displacement vector. Naturally, he wants to maximize the work, so that nothing goes to waste. All he has to do is choose where to move.

It is possible to move from the point $(0, 0)$ to any integer point in the circle $x^2 + y^2 \leq R^2$. The force vector is known — it is the same everywhere and has the coordinates (a, b) . Find the maximum work that Polesov is so curious about.

Input

The first line of the input file contains a single integer T — the number of tests ($1 \leq T \leq 1000$). It is followed by T lines, each containing three integers a, b — force vector coordinates, and R — the radius of the circle ($-10^9 \leq a, b \leq 10^9, 1 \leq R \leq 10^9$).

Output

For each test, print a single integer — the maximum work.

Example

<code>input.txt</code>	<code>output.txt</code>
3	20
10 -10 2	10
2 3 3	15
5 1 3	

Example explanation

In the first test, the circle with the center at the origin of coordinates and a radius of 2 contains 13 integer points. For the points $(2, 0)$, $(1, -1)$, $(0, -2)$, the dot product by the force vector $(10, -10)$ is maximal. For instance, $10 \times 1 + (-10) \times (-1) = 20$.