Problem B. Break Free

Input file:	`breakfree.in`
Output file:	`breakfree.out`
Time limit:	2 seconds
Memory limit:	512 mebibytes

Bob is taking part in TV show. The show takes place at at a large flat arena with n tigers. Arena is a half-plane, let us introduce coordinate system in such way that arena consists of all points with $y \geq 0$. Bob is blindfolded and put initially to a point (x, y).

The goal of Bob is to get out of the arena without being caught by a tiger. The exit from the arena a gate that is a segment connecting points $(0, 0)$ and $(a, 0)$. Bob knows his position and can choose any direction, but he is blindfolded, and he cannot see where the tigers are. Bob can run with the speed not exceeding v.

The tigers can see Bob, the i-th tiger is located at a point (x_i, y_i) and can move with a maximal speed u_i. After the start of the show Bob and the tigers are simultaneously set free.

Bob has decided to use the following strategy to escape the arena. He chooses some straight line segment that connects his initial point with some point of the gate, and runs along it with his maximal speed. Bob calls the point P of the gate *safe* if when running along the segment from his initial point to the point P he cannot be caught by a tiger. Let us denote the set of safe points as S. Now Bob wants to evaluate his chance of escaping, so he wants to find the *measure* $\mu(S)$ of the set of safe points.

In this problem the measure $\mu(S)$ is equal to the infimum of the set A of such a that there is a set of segments with total length a that completely cover S. Infimum of the set B is such b that there is no $t \in B$ which is less than b, but for each $b_0 > b$ there is such t.

Help Bob to find the measure of the set of safe points.

Input

The input file contains multiple test cases. The first line of the input file contains t — the number of tests in the input file ($1 \leq t \leq 100$).

The following lines describe test cases. The first line of each test case contains four integers: a, x, y and v ($1 \leq a \leq 10^4$, $-10^4 \leq x \leq 10^4$, $1 \leq y \leq 10^4$, $1 \leq v \leq 100$).

The second line contains n — the number of tigers ($1 \leq n \leq 100$).

The following n lines describe tigers. The i-th tiger is described by three integers: x_i, y_i, u_i ($-10^4 \leq x_i \leq 10^4$, $0 \leq y_i \leq 10^4$, $1 \leq u_i \leq 100$). No tiger is located at a point (x, y).

Output

For each test case output one floating point number: the measure of the set of safe points. Your output must have absolute or relative error not exceeding 10^{-7}.

Example

breakfree.in	breakfree.out
1 10 5 4 10 1 4 1 3	7.173513477283126