

Problem I. Immigration

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 256 mebibytes

Peter the Pig is riding a tractor, starting at the origin at moment 0 and moving along the x -axis with speed u . Since the road is infinite and not interesting enough, Peter is looking for entertainment. At moment t_0 he notices some object at point (x_0, y_0) moving with velocity $v_0 = (v_{0x}, v_{0y})$. So, Peter starts to rotate his head always keeping his eyes fixed at the object. From time to time (n times in total), the object changes its velocity. Namely, at moment t_i the object instantly changes its velocity to $v_i = (v_{ix}, v_{iy})$ for $i = 1, 2, \dots, n$. It is guaranteed that the object never collides with Peter.

Define $f(t)$ as the directed angle (measured in radians) between x -axis and the direction from Peter to the object at moment t . We allow $f(t)$ to differ from the actual angle by a multiple of 2π as long as the function $f(t)$ is continuous. Define the *angular speed* of Peter's head as the derivative $f'(t)$. You need to find the maximum of $|f'(t)|$ from the moment t_0 to the infinity. In other words, you need to find the maximum of the absolute value of angular speed. It is guaranteed that the answer is finite.

Input

The first line contains four integers u, x_0, y_0, n ($1 \leq u \leq 100, |x_0|, |y_0| \leq 10^8, 0 \leq n \leq 10^5$) — the speed of Peter's tractor, the coordinates of the object when first observed by Peter, and the number of times the object changes its velocity.

Each of the next $(n + 1)$ lines contains three space-separated integers t_i, v_{ix}, v_{iy} ($0 \leq t_i \leq 10^6, |v_{ix}|, |v_{iy}| \leq 100$). It is guaranteed that $t_0 < t_1 < \dots < t_n$. Note that it is possible that $(v_{ix}, v_{iy}) = (0, 0)$. Also note that movement of the object after moment t_n is infinite.

Output

In the only line print one real number with absolute or relative error not exceeding 10^{-6} — the maximum absolute value of the angular speed of Peter's head during his observation of the object.

Examples

standard input	standard output
1 0 -2 0 0 1 0	0.0000000000
2 0 -2 0 0 3 1	1.0000000000