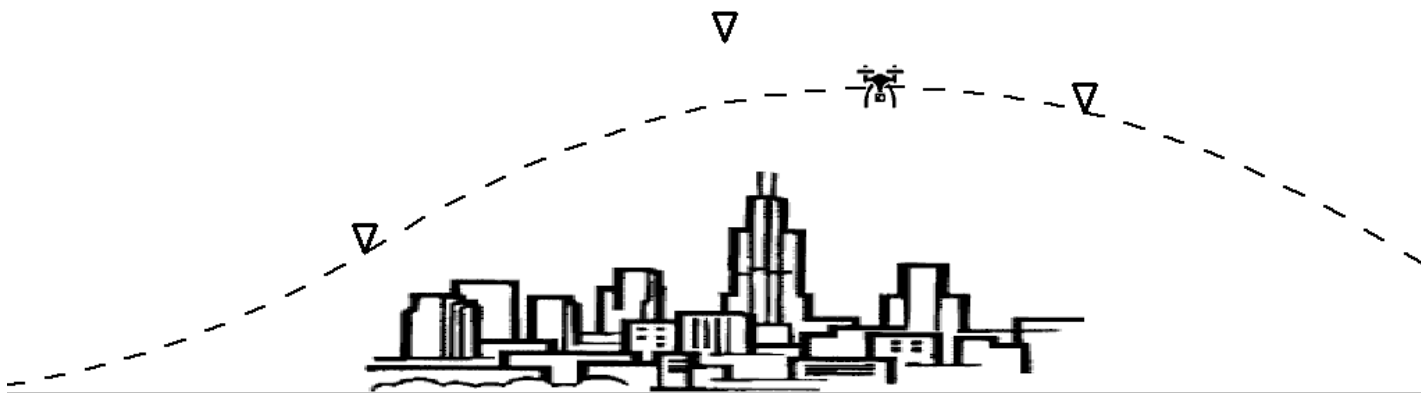


D • Magic Drone

For this problem, you're finally going to get a chance to use the drone you won a few years ago at the ICPC contest. The FAA is still cracking down on limiting the functionality of unmanned aircraft systems (UAS) so the waypoints (∇) impose legal regulations on the maximum altitude at which it is permitted to fly.



To be specific, you will fly your drone over a straight-line sidewalk which extends from $-\infty$ to $+\infty$. At position x_i feet, the regulation forbids flying at any altitude above y_i feet. As a result, you may be led to think that at each x_i you can fly up and take a picture of the city from altitude y_i . In reality, physical constraints may prevent you from doing so.

You may start your drone at rest from any point on the ground ($y=0$). While it is in the air, it will always move at a horizontal speed of exactly V mph. Its vertical acceleration is controllable within the range $[a_{min}, a_{max}]$ mph/s, with zero response time, regardless of current altitude. It must eventually land smoothly, meaning that the vertical velocity must be zero at both takeoff and landing.

For each specified point x_i , compute the maximum reachable altitude y'_i that can be achieved in a flight that meets all of the physical and legal constraints. Note that it is not necessary to reach all of the maxima in one continuous flight. Of course, it must be the case that $y'_i \leq y_i$.

Note that the regulations are point constraints. The drone must be at or below y_i at x_i but may have non-zero vertical velocity at x_i .



Input

The input consists of multiple lines. The first line contains four space separated values: the number of points, N ($1 \leq N \leq 2000$), the horizontal speed V , ($0 < V \leq 10$), in mph, and the vertical acceleration range, a_{min} and a_{max} , ($-5 \leq a_{min} < 0 < a_{max} \leq 5$) in mph/s.

The next N lines each specify a point, (x_i, y_i) , ($x_i < x_{i+1}$ and $0 \leq y_i \leq 400$). (FAA **Rule 14 CFR Part 107** says that a UAS may not go higher than 400 feet.)

Output

Output consists of N lines. Each line contains a single floating point value which is the implied maximum altitude y'_i in feet (to 3 decimal places) for the corresponding x_i .

Sample Input 1:

Input	Output
3 2 -2 2	30.000
20 30	33.887
70 400	34.693
80 250	

Sample Input 2

Input	Output
3 2 -2 2	256.571
60 350	254.371
70 400	250.000
90 250	

Sample Input 3:

Input	Output
3 2 -1 1	200.000
38 200	203.039
60 400	204.428
70 300	

Sample Input 4:

Input	Output
3 1 -1 1	154.563
21 300	151.194
35 400	150.000
40 150	