Angry Birds

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Aris is playing the classic game, Angry Birds!

Because Aris has been playing for too long, Yuuka confiscated Aris's game console and demanded that Aris complete today's math homework before getting it back.

However, Sensei did not assign any math homework to Aris today, so Yuuka had to come up with a problem for Aris to solve.

Consider the game field of Angry Birds as a three-dimensional Euclidean space, and the bird as a sphere with radius R_3. Establish a spatial Cartesian coordinate system $O - xyz$, such that the trajectory of the bird's center lies in the horizontal plane $z = 0$.

It is known that the trajectory of the bird's center is a closed polyline, consisting of n segments connected end to end. The connection points are n points: $(x_1, y_1, 0), (x_2, y_2, 0), \cdots, (x_n, y_n, 0)$. The i-th segment has endpoints $(x_i, y_i, 0)$ and $(x_{i \bmod n+1}, y_{i \bmod n+1}, 0)$. However, due to sensor errors, the actual n points may deviate from $(x_i, y_i, 0)$ by a distance not exceeding R_2 (the sensor deviation R_2 is the same for all points). That is, the actual i-th point $(x'_i, y'_i, 0)$ can be anywhere within the circle (which is still contained in the plane $z = 0$) centered at $(x_i, y_i, 0)$ with radius R_2.

Let S be the set of all points that the entire bird may pass through, i.e., points in 3D space whose distance to the bird's center trajectory is at most R_3. Yuuka requires Aris to compute the volume of the convex hull of S.

Convex hull: The convex hull of a point set S is defined as the smallest set T such that for any two points in S, all points on the line segment between them are contained in T.

Input

The first line contains a positive integer T ($1 \le T \le 10^3$), indicating the number of test cases.

For each test case, the first line contains three integers n, R_2, R_3 ($1 \le n \le 10^5, 0 \le R_2, R_3 \le 10^6$), representing the number of connection points, the sensor error radius, and the bird radius, respectively.

The next n lines each contain two integers x_i, y_i ($|x_i|, |y_i| \le 10^6$), representing the i-th connection point of the trajectory.

It is guaranteed that the sum of n over all test cases in a single test point does not exceed 10^5.

Output

For each test case, output a single floating-point number representing the answer. Your answer is considered correct if the relative or absolute error compared to the standard answer is at most 10^{-9}.

Let your answer be a and the standard answer be b. If $\frac{|a-b|}{\max\{b,1\}} \le 10^{-9}$, it is considered correct.

Example

standard input	standard output
1 5 1 1 0 0 3 1 2 3 2 2 -1 3	77.622211120429589

Note

The convex hull of all points that the bird's center may pass through: