A   A Rod in a Dot

There is no better way to relax than to enjoy a game of darts. However, the poor student Majki does not have a dart board. But Majki decided that this cannot stop him, so he made his own dart board. He was very creative: he took a square plank and attached a bunch of coasters to it. The goal of his game is to hit the coasters with darts he made of small rods.

POV: You've just been born to three fathers.

In order to enjoy his new creation, Majki is now throwing n rods of infinitely small diameter onto a square target of side s. Note that Majki is quite good at throwing rods, so the rods always land straight on the plank. In other words, they never land sideways. The target contains m coasters (circles), the ith of which has radius r_i and center (x_i, y_i). The coasters do not overlap and are fully contained in the square target. Majki always manages to hit the square target and the point of contact between the rod and the square target is uniformly distributed over the square target. Calculate the expected number of times that Majki's rod hits one of the coasters.

Input

The input consists of:

- One line with three integers n, s, and m ($0 \le n \le 10^6$, $2 \le s \le 10^6$, $0 \le m \le 10^6$), the number of rods Majki is throwing, the side length of the square plank, and the number of coasters.

- m lines, each with three integers x_i, y_i, and r_i ($1 \le x_i, y_i, r_i \le s - 1$), the center coordinates and the radius of the ith coaster.

Output

Output the expected number of times that Majki's rod hits one of the coaster.

Your answer should have an absolute or relative error of at most 10^{-6}.

Sample Input 1	Sample Output 1
1 2 1 1 1 1	0.7853981633974483

Sample Input 2	Sample Output 2
5 10 2 1 1 1 5 5 1	0.3141592653589793

Sample Input 3

Sample Output 3

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3 10 3
2 2 1
6 4 3
2 8 2
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1.3194689145077132
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