

제 10 회
대학생
프로그래밍
경시대회



Problem G

Fence

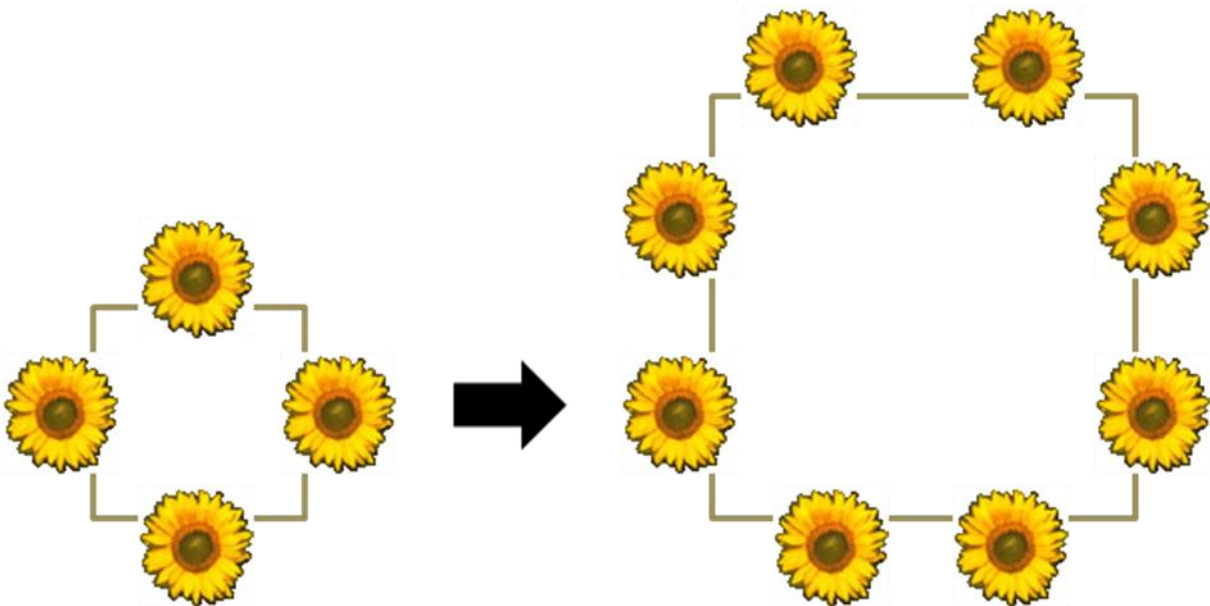


Figure 1. The illustration for the first sample input

Mr. A is dreaming his retirement living. He wants to live in a house fenced by flowers. He requested a design of his new house to a design company. He highly satisfied with the blueprint, which contains the design, but he wants more openings inside the fence. He showed the blueprint to a flower shop and said that the shape of the fence will not be changed but the area inside the fence will become wider. The shape of the fence in the blueprint is a closed curved and does not have any region that is arched in. The shape is so beautiful that Mr. A does not want to change the shape; the ratio of length of sides and the angles of which two adjacent sides meet. The cost of building flower fence is in proposition to the length of the flower fence. If the area inside the fence changes, then the building cost will be changed, too. How the length of the fence with the shape illustrated in the blueprint that surrounds the requested area can be computed?

Input

Input is given by the standard input. The number of test cases T ($1 \leq T \leq 20$) is give in the first line of the input. What follows are T test cases. The first line of each test case contains the area that should be surrounded by the new fence. From the second line of each test case, the shape of fence is given. The second line of each test case contains the number of points N ($3 \leq N \leq 10000$) that the fence makes a turn. Each of the following N lines contains the x-coordinate and y-coordinate of a turning point. The coordinates are given in a counter-clockwise order or a clockwise order. The coordinates and area is given by real numbers. The measure of length is m and the measure of area is m^2 .

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Output

You ought to use standard output. For each testcase, print a line that contains the length of the fence that surrounds the requested area in m².

Allowed error is 0.01% (relative error).

The following shows sample input and output for two test cases.

| Sample Input | Output for the Sample Input |
|--|-----------------------------|
| 2 4.0 4 0.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 100.0 3 -4.0 0.0 -4.0 16.0 12.0 0.0 | 8.0 48.2843 |