B. The Flash & Pikaaaaaaachuuuuuuuuuu!!!

Score: 1

CPU: 1s
Memory: 1024MB

One day, Barry Allen AKA The Flash was getting bored working in S.T.A.R. labs. Suddenly, he thought of passing his time playing Pokémon Go! So, he took his phone and rushed(or should one say Flashed!) to the nearest park where so many pokémons wander around. So, he starts the game and to his surprise, he notices a rare pokémon is just playing in an area surrounded by trees. The pokémon is the one and only Pikaaaaaaachuuuuuuuuu!!!!

Now, Barry gets excited to catch it. But the rules of Pokémon Go is slightly different in Barry's timeline you know? Because he just likes to change his timeline all the time! The rules in this case are that, to catch a pokémon, you have to choose a tree, start running from that tree to another, and from that one to another, and so on, eventually coming back to the tree you started running from, thus creating an enclosed area (it must be positive). If the pokémon you want to catch is strictly inside that area, then voila! You have caught the pokémon. Otherwise, you fail.

Now, Barry has the positions of the trees in the park along with the position of Pikachu. Inspite of being the Flash, Barry wants to finish this as soon as possible. Though Barry's speed is quite formidable, just for the sake of this game, we consider it just 1 unit/second. Now, given the positions of the tree and Pikachu, help Barry to determine the minimum time he needs to catch it.

Remember, Barry always runs in a straight line. And no **3** trees are on the same line.

Input

Input starts with an integer **T($1 \le T \le 80$)**, denoting the number of test cases. Each case contains **2** integers **X, Y ($-10^6 \le X, Y \le 10^6$)** in the first line, position of Pikachu. The next line contains an integer **N($1 \le N \le 100$)**, indicating the number of trees in the park. The next **N** lines each will contain **2** integers **X, Y($-10^6 \le X, Y \le 10^6$)**, denoting the position of the trees.

Output

For each case of input, print the case number and the answer of that case. You have to print **6** digits after decimal point.

If Barry is unable to catch Pikachu, the answer should be **-1**.

Sample

Input	Output

Input	Output
2 1 1 3 0 0 5 0 0 5 1 1 2 1 0 100 50	Case 1: 17.071068 Case 2: -1