Problem M. Triangle in Triangle

Ballon:	
Time limit:	1.5 seconds
Memory limit:	256 megabytes

> 10 talented individuals in combinatorics or dynamic programming cannot match the skills of one talented individual in geometry.
>
> Cao Cao did not say this quote

On the 2D Cartesian plane, you are given a non-degenerate triangle ABC. Your tasks are:

1. Construct the largest regular triangle PQR such that vertices P, Q, and R lie on segment AB, BC, and CA, respectively.

2. Construct the smallest regular triangle $P'Q'R'$ such that vertices P', Q', and R' lie on segment AB, BC, and CA, respectively.

Input

The first line contains the number of test cases t ($1 \le t \le 10^5$).

Each test case is described by a single line containing three pairs of integers (x_A, y_A), (x_B, y_B), (x_C, y_C) — the coordinate of the vertices of the given triangle ABC. The vertices are listed in counter-clockwise order.

The coordinates of all vertices are between -10^3 and 10^3. It is guaranteed that all triangles given in the input are non-degenerate.

Output

For each test case, print two real number — the edge length of the required largest and smallest triangle, respectively.

Definitions:

- p and P are the edge lengths of the smallest and largest triangles that you printed.

- j and J are the edge lengths of the smallest and largest triangles provided by the jury.

Your answer will be considered **correct** if the relative or absolute error between the edge length of the contestant's smallest and largest triangles to jury's is be no more than 10^{-9}, i.e., $\dfrac{|p - j|}{max(1, j)} \le 10^{-9}$ and $\dfrac{|P - J|}{max(1, J)} \le 10^{-9}$.

Example

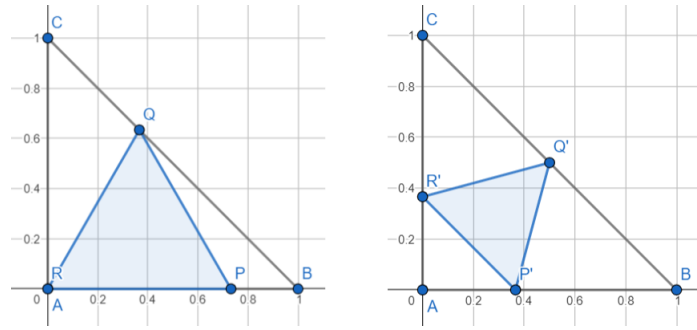| standard input	standard output
4	0.732050807569 0.517638090205
0 0 1 0 0 1	3.105828541230 2.477529576886
4 4 1 1 10 1	5.718776704299 3.493284678235
4 6 1 1 10 1	3.105828541230 1.834583397065
4 4 1 1 5 1	

Note

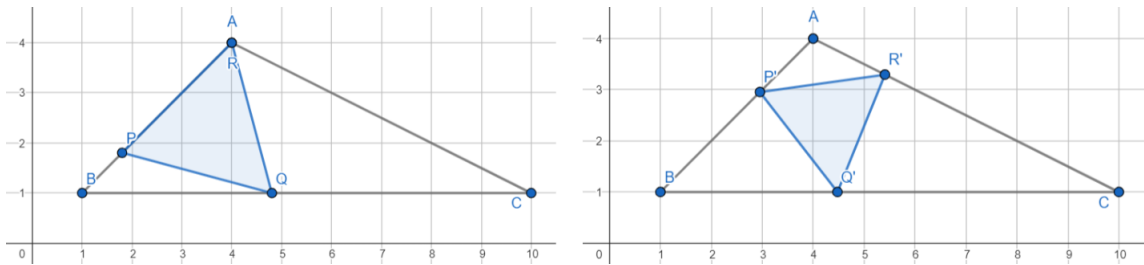Illustration of the first sample.

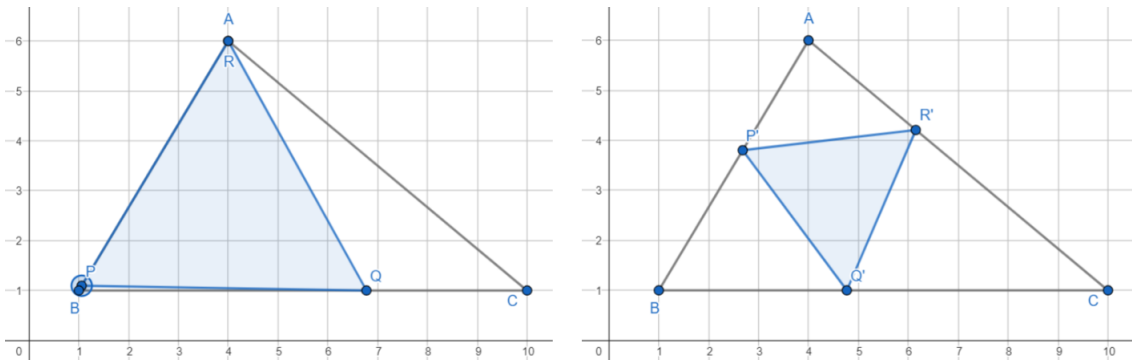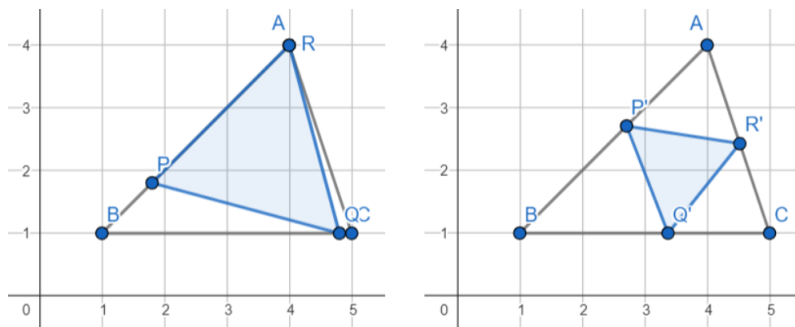
Illustration of the second sample.

Illustration of the third sample.

Illustration of the fourth sample.