Problem J

Skyline

Last time I visited Shanghai I admired its beautiful skyline. It also got me thinking, "Hmm, how much of the buildings do I actually see?" since the buildings wholly or partially cover each other when viewed from a distance.

In this problem, we assume that all buildings have a trapezoid shape when viewed from a distance. That is, vertical walls but a roof that may slope. Given the coordinates of the buildings, calculate how large part of each building that is visible to you (i.e. not covered by other buildings).

Input specifications

The first line contains an integer, N ($2 \leq N \leq 100$), the number of buildings in the city. Then follows N lines each describing a building. Each such line contains 4 integers, x_1, y_1, x_2, and y_2 ($0 \leq x_1 < x_2 \leq 10000, 0 < y_1, y_2 \leq 10000$). The buildings are given in distance order, the first building being the one closest to you, and so on.

Output specifications

For each building, output a line containing a floating point number between 0 and 1, the relative visible part of the building. The absolute error for each building must be $< 10^{-6}$.

Sample input 1	Sample output 1
4	1.00000000
2 3 7 5	0.38083333
4 6 9 2	1.00000000
11 4 15 4	0.71428571
13 2 20 2	

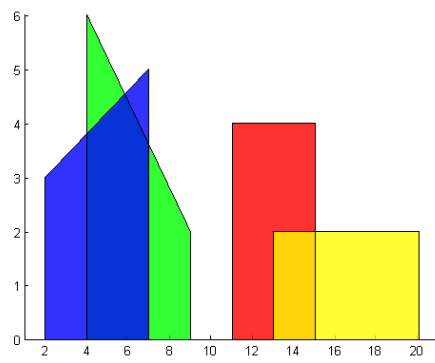| Sample input 2	Sample output 2
5	1.00000000
200 1200 400 700	1.00000000
1200 1400 1700 900	1.00000000
5000 300 7000 900	1.00000000
8200 400 8900 1300	0.73667852
0 1000 10000 800	

Figure 1: Figure of the first sample case