

Task 2. Cutting

You have a rectangular sheet of paper with dimensions $N \times M$ centimeters. The sheet is squared into a net of squares 1×1 centimeters each. You can consider the sheet as a coordinate system - its lower left corner is the origin $(0,0)$ of the coordinate system and each vertex of a square is assigned with integer coordinates – between 0 and N on the x axis and between 0 and M on the y axis. You are receiving a sequence of requests for cutting the sheet of paper (or more precisely, the piece that has left from it). Each request is defined by a pair of nonnegative integers (p, q) , representing a vertex from the net, that is situated into the uncut portion of the paper. Cutting is executed according to the following algorithm: two segments are drawn, both starting at point (p, q) , one is at an angle of 45° , and the other at an angle of 135° to the axis x , pointed “upwards”, i.e. with increasing y . Both segments end at the border of the rectangular sheet of paper. After that the portion of the paper that is **above** the drawn segments is cut off and the rest piece of paper remains as a new figure (see the example pictures)

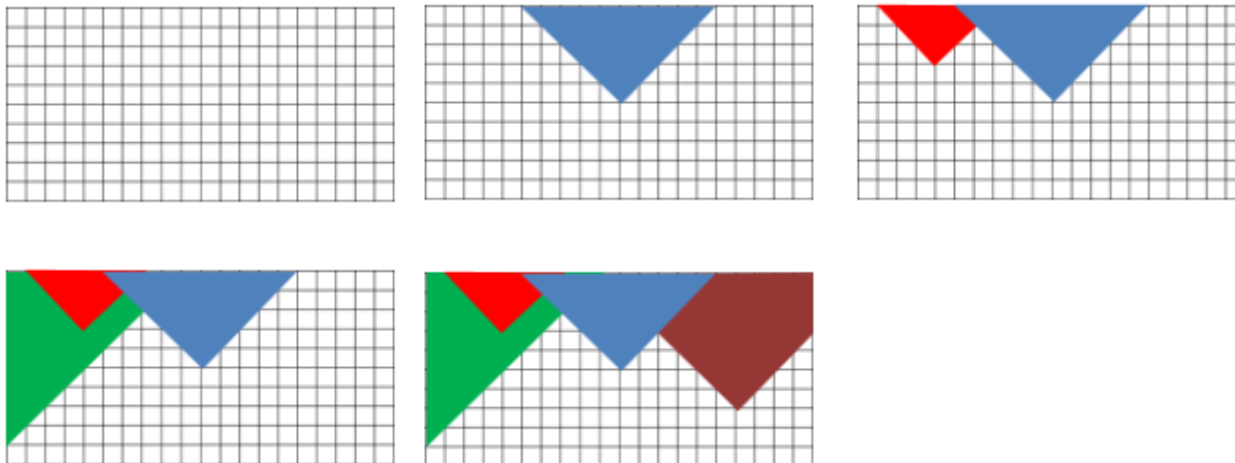
Following is an example with starting rectangular paper with dimensions $N=20$ and $M=10$, as well as all figures that remain after following cutting requests:

$(10,5)$ – the blue part is cut

$(4,7)$ – the red part is cut

$(0,1)$ – the green part is cut

$(16,3)$ – the brown part is cut



Task: Write a program **cutting** that after each request calculates the remaining figure’s area.

Important: It is possible to receive a request which will define one of the segments with length 0, for example if the point is situated on the leftmost or rightmost border of the rectangle. **However, it is guaranteed that each request will lead to cutting a positive area figure.**

Input. From the first line of the standard input read two positive integers N and M – dimensions of the initial sheet of paper. From the second line read a positive integer Q – number of cutting requests. From the last Q lines read two nonnegative integers x and y , separated by space – coordinates of the point, which defines a cutting request.

Output. For each cutting request, on a separate line, your program should print one number – area of the paper figure remaining after the cutting. The value of the area should be printed with two digits after the decimal point.

Constraints

$$1 \leq N \times M \leq 10^{12}$$

$$1 \leq Q \leq 150\,000$$

In 20% of the tests: $1 \leq N \leq 10\,000$, $1 \leq Q \leq 10\,000$

In 52% of the tests: $1 \leq N \leq 1\,000\,000$

Evaluation

Each test is evaluated separately.

Example (corresponding to the example with pictures above)

Input	Output
20 10	175.00
4	167.00
10 5	138.50
4 7	103.00
0 1	
16 3	