Task 2. Cutting

You have a rectangular sheet of paper with dimensions *N* x *M* centimeters. The sheet is squared into a net of squares 1 x 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)

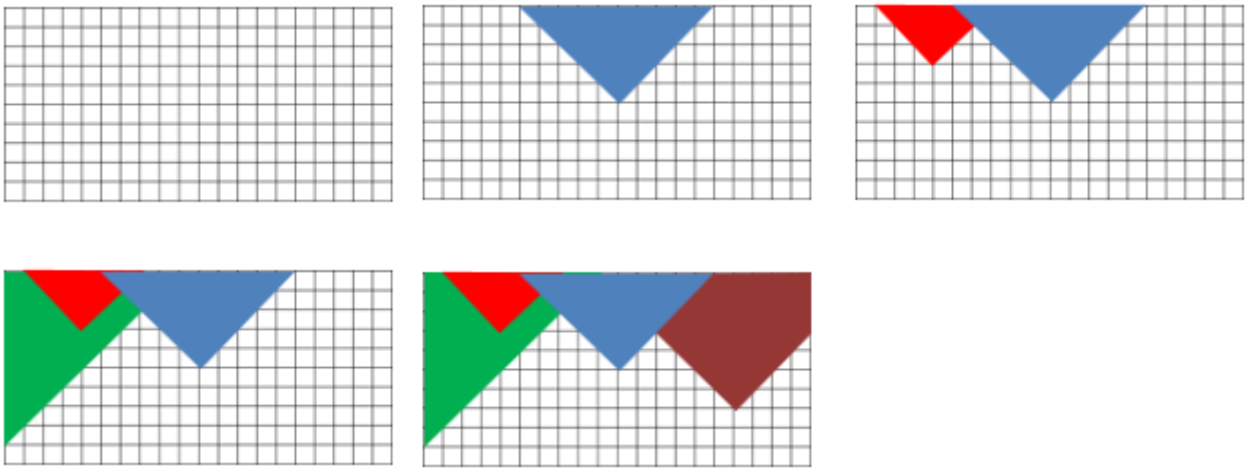
Following is an example with starting rectangular paper with dimensions *N*=20 and *M*=10, as well as all figures that remain after following cutting requests:

(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 seperate 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

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

$1 \le Q \le 150\,000$

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

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

Evaluation

Each test is evaluated separately.

Example (corresponding to the example with pictures above)

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