Problem B
Bisectors

Input: Standard Input
Output: Standard Output

We all probably know how to find equation of bisectors in Coordinate Geometry. If the equations of two lines are $a_i x + b_i y + c_i = 0$ and $a_j x + b_j y + c_j = 0$, then the equations of the bisectors of the four angles they create are given by $\dfrac{a_i x + b_i y + c_i}{\sqrt{a_i^2 + b_i^2}} = \pm \dfrac{a_j x + b_j y + c_j}{\sqrt{a_j^2 + b_j^2}}$. Now one has to be quite intelligent to find out for which angles to choose the '+'(plus) sign and for which angles to choose the '-'(minus) sign. You will have to do similar sort of choosing in this problem. Suppose there is a fixed point (C_x, C_y) and there are n (n≤10000) other points around it. No two points from these n points are collinear with (C_x, C_y). If you connect all these point with (C_x, C_y) you will get a star-topology like image made of n lines. The equations of these n lines are also given and only these equations must be used when finding the equation of bisectors. This n lines create n(n-1)/2 acute or obtuse angles in total and so they have total n(n-1)/2 bisectors. You have to find out how many of these bisectors have equations formed using the + sign. The image below shows an image where n=5, C_x=5 and C_y=2. This image corresponds to the only sample input.

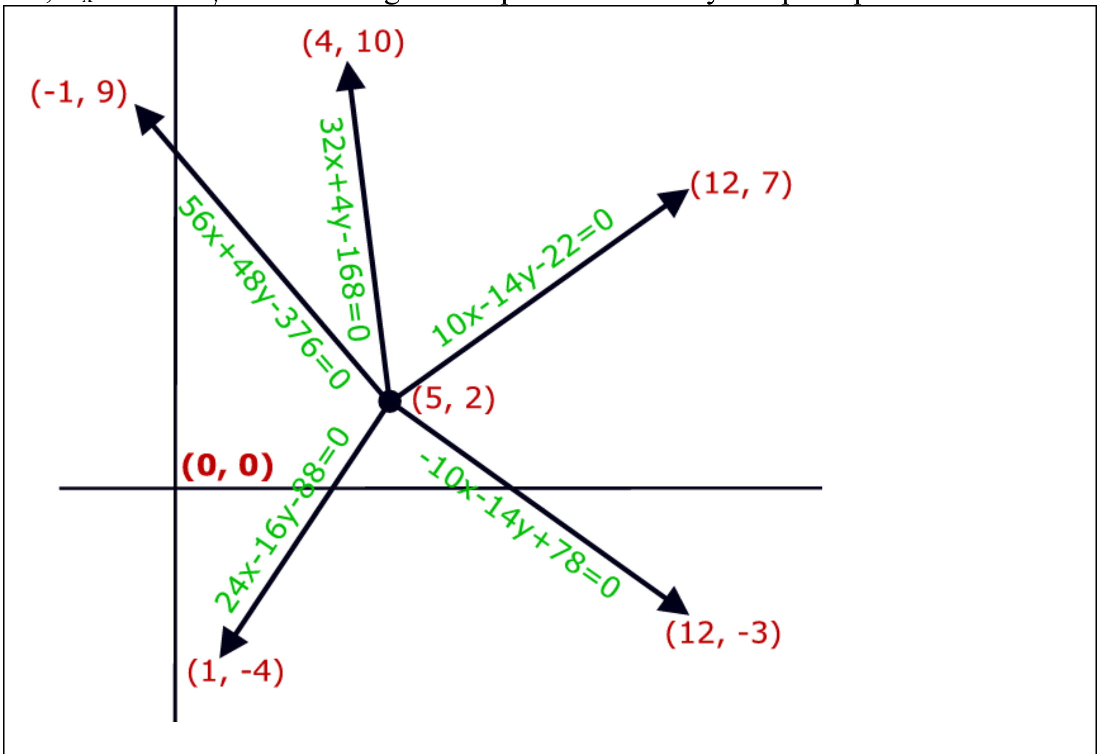

Figure: Five lines above create 5(5-1)/2=10 angles and these angles has 10 bisectors. Of these 10 bisectors, the equation of only 4 are formed using the + sign of the formula $\dfrac{a_i x + b_i y + c_i}{\sqrt{a_i^2 + b_i^2}} = \pm \dfrac{a_j x + b_j y + c_j}{\sqrt{a_j^2 + b_j^2}}$

Input

The input file contains maximum 35 sets of inputs. The description of each set is given below:

First line of each set contains three integers C_x, C_y ($-10000 \le C_x, C_y \le 10000$) and n ($0 \le n \le 10000$). Each of the next n lines contains two integers xi, yi ($20000 \le xi, yi \le 20000$) and a string of the form $a_ix+b_iy+c_i=0$. Here (xi, yi) is the coordinate of a point around (Cx, Cy) and the string denotes the equation of the line segment formed by connecting (C_x, C_y) and (xi, yi). You can assume that ($-100000 \le a_i, b_i \le 100000$) and ($-2000000000 \le c_i \le 2000000000$). This equation will actually be used to find the equations of bisectors of the angles that this line creates.

Input is terminated by a set where the value of n is zero.

Output

For each set of input produce one line of output. This line contains an integer number P that denotes of the $\frac{n(n-1)}{2}$ bisector equations how many are formed using the + sign in the bisector equation $\frac{a_ix+b_iy+c_i}{\sqrt{a_i^2+b_i^2}} = \pm\frac{a_jx+b_jy+c_j}{\sqrt{a_j^2+b_j^2}}$.

Sample Input	Output for Sample Input

`5 2 5`
`12 7 10x-14y-22=0`
`1 -4 24x-16y-88=0`
`4 10 32x+4y-168=0`
`-1 9 56x+48y-376=0`
`12 -3 -10x-14y+78=0`
`10 10 0`
	`4`

Problemsetter: Shahriar Manzoor
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