

## B. Lasers

time limit per test: 2 seconds

memory limit per test: 256 megabytes

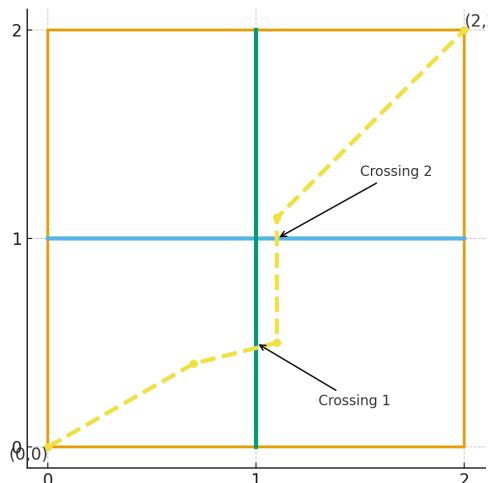
There is a 2D-coordinate plane that ranges from  $(0, 0)$  to  $(x, y)$ . You are located at  $(0, 0)$  and want to head to  $(x, y)$ .

However, there are  $n$  horizontal lasers, with the  $i$ -th laser continuously spanning  $(0, a_i)$  to  $(x, a_i)$ . Additionally, there are also  $m$  vertical lasers, with the  $i$ -th laser continuously spanning  $(b_i, 0)$  to  $(b_i, y)$ .

You may move in any direction to reach  $(x, y)$ , but your movement must be a continuous curve that lies inside the plane. Every time you cross a vertical or a horizontal laser, it counts as one crossing. Particularly, if you pass through an intersection point between two lasers, it counts as **two crossings**.

For example, if  $x = y = 2$ ,  $n = m = 1$ ,  $a = [1]$ ,  $b = [1]$ , the movement can be as follows:

Minimum crossings = 2 (must cross  $x=1$  and  $y=1$  once each)



What is the minimum number of crossings necessary to reach  $(x, y)$ ?

### Input

The first line contains  $t$  ( $1 \leq t \leq 10^4$ ) — the number of test cases.

The first line of each test case contains four integers  $n$ ,  $m$ ,  $x$ , and  $y$  ( $1 \leq n, m \leq 2 \cdot 10^5$ ,  $2 \leq x, y \leq 10^9$ ).

The following line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $0 < a_i < y$ ) — the y-coordinates of the horizontal lasers. It is guaranteed that  $a_i > a_{i-1}$  for all  $i > 1$ .

The following line contains  $m$  integers  $b_1, b_2, \dots, b_m$  ( $0 < b_i < x$ ) — the x-coordinates of the vertical lasers. It is guaranteed that  $b_i > b_{i-1}$  for all  $i > 1$ .

It is guaranteed that the sum of  $n$  and  $m$  over all test cases does not exceed  $2 \cdot 10^5$ .

### Output

For each test case, output the minimum number of crossings necessary to reach  $(x, y)$ .

### Example

**input**

```
2
1 1 2 2
1
1
2 1 100000 100000
42 58
```

### Codeforces Round 1050 (Div. 4)

Finished

Practice



### → Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest](#)

### → Clone Contest to Mashup

You can clone this contest to a mashup.

[Clone Contest](#)

### → Submit?

Language: [GNU G++17 7.3.0](#)  
 Choose file: [Escolher Arquivo](#) Nenh...colhido

### → Last submissions

Submission	Time	Verdict
<a href="#">338461624</a>	Sep/13/2025 18:41	Accepted
<a href="#">338460124</a>	Sep/13/2025 18:39	Time limit exceeded on test 2
<a href="#">338456806</a>	Sep/13/2025 18:36	Wrong answer on test 1

### → Problem tags

[geometry](#) \*800

No tag edit access

### → Contest materials

- Announcement (en) 

- Tutorial (en) 

2

3

[Codeforces](#) (c) Copyright 2010-2025 Mike Mirzayanov

The only programming contests Web 2.0 platform

Server time: Nov/11/2025 09:10:35<sup>UTC-3</sup> (i2).

Desktop version, switch to [mobile version](#).

[Privacy Policy](#) | [Terms and Conditions](#)

Supported by

