

There is a  $2 \times D$  rectangular field of size  $N \times M$ . There is a goblin at position  $(0, 0)$  on the field. The goblin loves gold and tries to collect as much of it as he can. There is a gold storage present at the position  $(N, M)$  and the goblin wants to get to that storage to get the gold. But goblins are very weak, and they will die even if a single cannon hits them. So, he can not step at a point which lies in the range of any cannon.

You want to stop the goblin from getting the gold. The cannons can only be placed on one of the two lines passing through the centers of opposite sides i.e. you have to choose one line among the two possible lines and then place the cannons only on that line. You have  $C$  cannons and you need to place some or all of them in the field. Each cannon has a range  $R_i$ . You have to find the minimum number of cannons you need to stop the goblin for reaching the gold storage.

Note -

- The goblin can move to any point on the field.
- The range of the cannons are NOT integers. They can be any real number.
- The cannons can shoot at any position  $p(x, y)$ , if  $distance(p, P_i) \leq R_i$ , where  $distance(p, P_i)$  is the euclidean distance between those points.
- You can place the cannons only on one of the two lines and cannot use both.

## Input Format

First line contains  $T$ , the number of test cases. For each test case,

The first line contains 3 integers  $N$ ,  $M$  and  $C$ .

Next line contains  $C$  real number, the range of each cannon.

$T$

$N M C$

$R_1 R_2 R_3 \dots R_C$

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## Constraints

- $1 \leq T \leq 10$
- $1 \leq N, M \leq 10^9$
- $0 \leq R_i \leq 10^9$
- $0 \leq C \leq 10^5$

## Output Format

For each test case print the minimum number of cannons required to stop the goblin. If the goblin cannot be stopped print -1.

### Sample Input 0

```
2
1 1 1
1
10 10 2
2.5 2.5
```

### Sample Output 0

```
1
2
```