Basketball 2

Description

HH likes to play basketball very much. Actually, He is a talented basketball player. He scores everytime he shoot the ball.

This night, there isn't any game to play. Thus, HH practices dribbling to enhance himself. As a top basketball player, HH is curios about how good is his dribbling. Then, he starts to observe the position where basketball bounces back. Since basketball bears some force from HH and also isn't a perfect sphere, the position where basketball touches during bouncing also isn't a perfect circle or oval. Formally, it can be formatted as convex polygon.

With some high-tech equipment, HH can record the convex polygon from each bouncing. Now, HH is wondering the area of the intersection of consecutive two bouncing. He thinks that if the area is larger, his dribbling ability is better. Now, HH asks you to help him find out the area.

Input

The first line contains an integer T indicating the total number of test cases. For each test case, first line contains two integer N, M indicating first convex polygon contains N vertices while second convex polygon contains M vertices. Following N lines each contains two integers x_i, y_i indicating the coordinate of i-th vertex of first convex polygon. Following M lines each contains two integers x_j, y_j indicating the coordinate of j-th vertex of second convex polygon.

- $1 \leq T \leq 100$
- $3 \leq N, M \leq 100$
- $-10^5 \leq x_i, y_i, x_j, y_j \leq 10^5$
- vertices of each convex polygon will be given in arbitrary order.
- vertices of each convex polygon are guaranteed to be correct.
- At most 10 test cases with $\min(N, M) > 10$.

Output

For each test case, please output one line indicating the area of the intersection of two polygon.

Absolute or relative error less than 10^{-7} is considered correct.

Sample Input

```
2
3 3
0 0
1 0
0 1
0 0
-1 0
0 -1
4 4
0 0
2 2
2 0
0 2
1 0
3 0
1 2
3 2
```

Sample Output

```
0
2
```