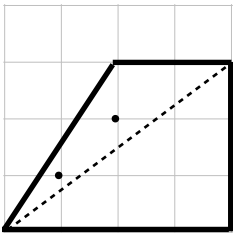


2019 COG DAY

Preparations are underway at *Widget, Whatsit & Doodah* (Est. 1862) for the annual *Cog Day* festivities, when the families of employees join together to celebrate the founding of the company with a variety of cog-based activities. *Widget Senior* has very kindly offered his walled garden for this year's event. The garden walls run in straight lines, only changing direction at corners. It is not possible to see over the walls – nevertheless every point of the garden is directly visible from every other point.

A portion of the garden is being cordoned off for *Cog Day*, by a single straight piece of “do not cross” tape running between two non-adjacent corners of the garden. Several majestic trees sit within the garden. *Widget Senior* is generous, so the cordoned-off portion is to be as large as possible, but also protective of his trees, so this area must exclude all of the trees. The tape is not allowed to touch the trees.



For example, suppose the corners of the garden are at $(0,0)$, $(4,0)$, $(4,3)$ and $(2,3)$ and there are trees at $(1,1)$ and $(2,2)$. The largest area of 6 can be obtained by running the tape between $(0,0)$ and $(4,3)$.

SAMPLE INPUT

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

SAMPLE OUTPUT

```
6
```

The first line of input will contain c ($4 \leq c \leq 3,000$) indicating the number of corners in the garden, followed by t ($2 \leq t \leq 10,000$), indicating the number of trees.

The next c lines will consist of two integers indicating the co-ordinates of the i^{th} corner. There is a wall between all adjacent corners in the list, as well as the 1st and c^{th} corner. Exactly two walls meet at each corner, those walls are never parallel and corners will be given in an anticlockwise direction.

The next t lines will consist of two integers indicating the co-ordinates of the i^{th} tree. All trees will be within the garden and not touching a wall, or each other.

All co-ordinates will be given as x then y ($-1,000,000 \leq x, y \leq 1,000,000$).

You should output the maximum possible area (rounded down to the nearest integer) which can be allocated for *Cog Day*. *Widget Senior* has already bought the tape, so each test input will have a solution.

You can submit your solution against *Cog Day* or *Cog Day (Bonus)*

Cog Day (Bonus) has test data where c and t have an upper limit of 100,000 and co-ordinates are $(-1,000,000,000 \leq x, y \leq 1,000,000,000)$