

13226 Just Pentagon Perimeter

Given a set of points in the plane, find the convex pentagon with largest perimeter such that each vertex of the pentagon is a unique point in the point set! Note that convex means no line segment between two points on the boundary of the pentagon ever goes outside the pentagon.

Input

A number of test cases (≤ 100), one per line, each with N ($1 \leq N \leq 8500$), followed by N points with (x, y) integer.

Each integer fit in 32 bits signed. Note there are no duplicate points.

Output

Output the perimeter rounded to 2 decimal places on one line for each test case. If no such pentagon exists, print '-1'.

Sample Input

```
1
0 0
6
0 0
0 2
1 2
1 3
2 0
2 2
```

Sample Output

```
-1
8.83
```