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## Maximum perimeter

P57181\_en

Novè Concurs de Programació de la UPC - Final (2011-09-21)

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Given  $n$  different points on the plane, pick any three of them so that the perimeter of the resulting triangle is maximum.

### Input

Input consists of several cases, each with  $n$  followed by  $n$  pairs of integer coordinates  $(x, y)$ . Assume  $3 \leq n \leq 10^4$ ,  $-10^8 \leq x, y \leq 10^8$ , and that no three given points are collinear.

### Output

For every case, print the maximum perimeter of all the possible triangles with four digits after the decimal point. The input cases have no precision issues.

### Observation

All “big” private test cases were built by choosing a “typical” geometric figure (such as a rectangle, a triangle, a circle, an ellipse, or alike), and placing  $n$  points at random inside it, always avoiding repeated points and points that would be collinear with two other points.

### Sample input

```
3 0 0 0 1 1 0
5 -1 1 3 2 1 1 -2 -1 1 -3
```

### Sample output

```
3.4142
14.8217
```

### Problem information

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