Problem D: Bounding box

The Archeologists of the Current Millenium (ACM) now and then discover ancient artifacts located at vertices of regular polygons. The moving sand dunes of the desert render the excavations difficult and thus once three vertices of a polygon are discovered there is a need to cover the entire polygon with protective fabric.

Input contains multiple cases. Each case describes one polygon. It starts with an integer $n <= 50$, the number of vertices in the polygon, followed by three pairs of real numbers giving the x and y coordinates of three vertices of the polygon. The numbers are separated by whitespace. The input ends with a n equal 0, this case should not be processed.

For each line of input, output one line in the format shown below, giving the smallest area of a rectangle which can cover all the vertices of the polygon and whose sides are parallel to the x and y axes.

Sample input

```
4
10.00000 0.00000
0.00000 -10.00000
-10.00000 0.00000
6
22.23086 0.42320
-4.87328 11.92822
1.76914 27.57680
23
156.71567 -13.63236
139.03195 -22.04236
137.96925 -11.70517
0
```

Output for the sample input

```
Polygon 1: 400.000
Polygon 2: 1056.172
Polygon 3: 397.673
```