

6416 Isle of the birds

A super-intelligent species of coconut-eating tropical bird has decided to develop a scenic flight path roughly following the perimeter of the island that they inhabit. Owing to the impressive energy consumption of their overdeveloped brains, these birds can only afford to fly in straight lines from one coconut tree to the next.

The birds reasoned that they can approximate the shape of their island (from a bird's-eye view, if you must) by imagining a rubber band that is stretched to circumscribe the island. The band is then released so that it contracts until it makes contact with the trunks of some of the coconut trees found on the island. The resulting shape of the elastic band thus forms straight lines between the coconut trees it is in contact with (allowing efficient travel), whilst maintaining the additional property that any line with endpoints inside the shape will be contained entirely within the shape. This implies that all coconut trees will fall strictly inside the shape defined by the rubber band.

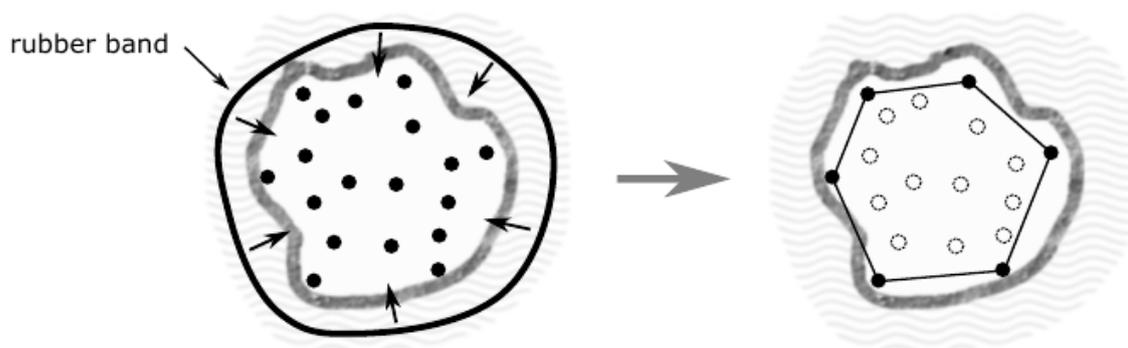


Figure 1: Illustration of how the rubber band starts out circumscribing the island, and then contracts to make contact with some of the trees.

The birds know the exact coordinates of each and every tree on the island. Using only this information, they now want to calculate the number of trees required to define the shape formed by the rubber band.

Input

Your input consists of an arbitrary number of records, but no more than 20. Each record starts with the integer value n , denoting the number of points in that record, followed by n pairs of real numbers separated by white space (one or more space and/or newline characters), with $3 \leq n \leq 15000$. Individual coordinates are in the range $[-8, 8]$ in both dimensions. Each number will have at most 20 digits after the decimal point.

The input data is guaranteed to satisfy the following property: for any three points, the triangle formed by said points will have an area of at least 10^{-10} . You may assume that the tree trunks are infinitely thin.

The end of input is indicated by a line containing only the value '-1'.

Output

For each input record, output

k

where k denotes the number of trees required to define the shape formed by the hypothetical rubber band stretched around the tree trunks.

Sample Input

```
5
-1.0 -1.0
1.0 1.0
-1.0 1.0
1.0 -1.0
0.1 0.3
5
1.0 0.0
0.5 -1.0
0.0 1.0
-1.0 0.0
-0.5 -1.0
-1
```

Sample Output

```
4
5
```