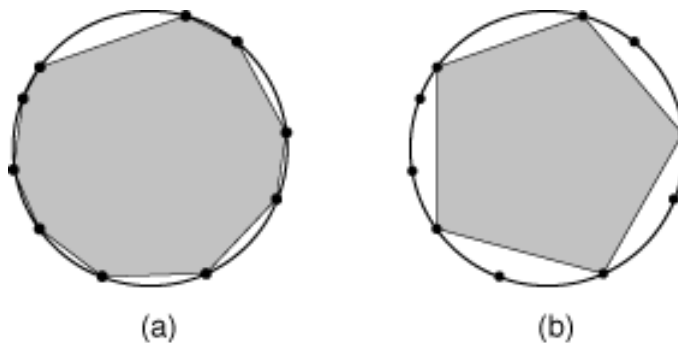


## 4220 Shrinking Polygons

A polygon is said to be *inscribed* in a circle when all its vertices lie on that circle. In this problem you will be given a polygon inscribed in a circle, and you must determine the minimum number of vertices that should be removed to transform the given polygon into a *regular polygon*, i.e., a polygon that is equiangular (all angles are congruent) and equilateral (all edges have the same length).

When you remove a vertex  $v$  from a polygon you first remove the vertex and the edges connecting it to its adjacent vertices  $w_1$  and  $w_2$ , and then create a new edge connecting  $w_1$  and  $w_2$ . Figure (a) below illustrates a polygon inscribed in a circle, with ten vertices, and figure (b) shows a pentagon (regular polygon with five edges) formed by removing five vertices from the polygon in (a).



In this problem, we consider that any polygon must have at least three edges.

### Input

The input contains several test cases. The first line of a test case contains one integer  $N$  indicating the number of vertices of the inscribed polygon ( $3 \leq N \leq 10^4$ ). The second line contains  $N$  integers  $X_i$  separated by single spaces ( $1 \leq X_i \leq 10^3$ , for  $0 \leq i \leq N - 1$ ). Each  $X_i$  represents the length of the arc defined in the inscribing circle, clockwise, by vertex  $i$  and vertex  $(i + 1) \bmod N$ . Remember that an *arc* is a segment of the circumference of a circle; do not mistake it for a *chord*, which is a line segment whose endpoints both lie on a circle.

The end of input is indicated by a line containing only one zero.

### Output

For each test case in the input, your program must print a single line, containing the minimum number of vertices that must be removed from the given polygon to form a regular polygon. If it is not possible to form a regular polygon, the line must contain only the value '-1'.

### Sample Input

```

3
1000 1000 1000
6
1 2 3 1 2 3
3
1 1 2
10
```

10 40 20 30 30 10 10 50 24 26  
0

### Sample Output

0  
2  
-1  
5