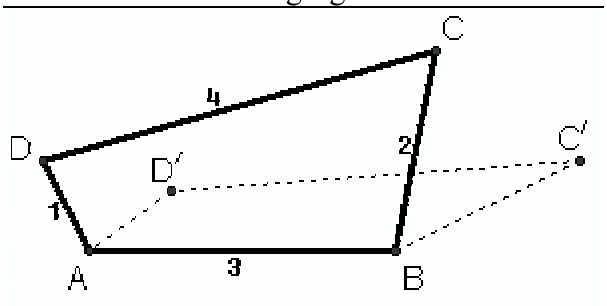
# Problem B: Area of Polygon

Input file name: polygon.in

For a $n$-sided simple polygon, if we know the coordinates of all its $n$ vertices, for example counterclockwise $(x_1, y_1)$, $(x_2, y_2)$, ..., $(x_n, y_n)$, the area of this polygon can be computed by so-called the Surveyor's Formula:

$$Area = \left| \frac{1}{2} \left( \begin{vmatrix} x_1 & x_2 \\ y_1 & y_2 \end{vmatrix} + \begin{vmatrix} x_2 & x_3 \\ y_2 & y_3 \end{vmatrix} + \cdots + \begin{vmatrix} x_{n-1} & x_n \\ y_{n-1} & y_n \end{vmatrix} + \begin{vmatrix} x_n & x_1 \\ y_n & y_1 \end{vmatrix} \right) \right|$$

But what if we only know the lengths of all $n$ edges of a polygon? In the case of $n = 3$ (triangle), the area can be determined by the well-known Hero's Formula. However, when $n \geq 4$, things become complicated because the area could be greatly affected by the angles, which is illustrated in the following figure:




Here comes our problem: given $n$ sticks of length 1, 2, 3, …, $n$, you are required to construct a $n$-sided polygon using these $n$ sticks as the polygonal edges. And the objective is to arrange the sticks and choose the angles so that the area of this polygon is maximized.

## Input (from polygon.in)

The input for this problem contains several configurations, one per line.
For each line, there is only one integer $n$ ($3 \leq n \leq 100$).
A line with a single -1 indicates the end of the input.

## Output

The output should be one real number per line, shows the maximized area, correct to four decimal places.

## Sample Input

4
6
-1

## Sample Output

4.8990
29.2490