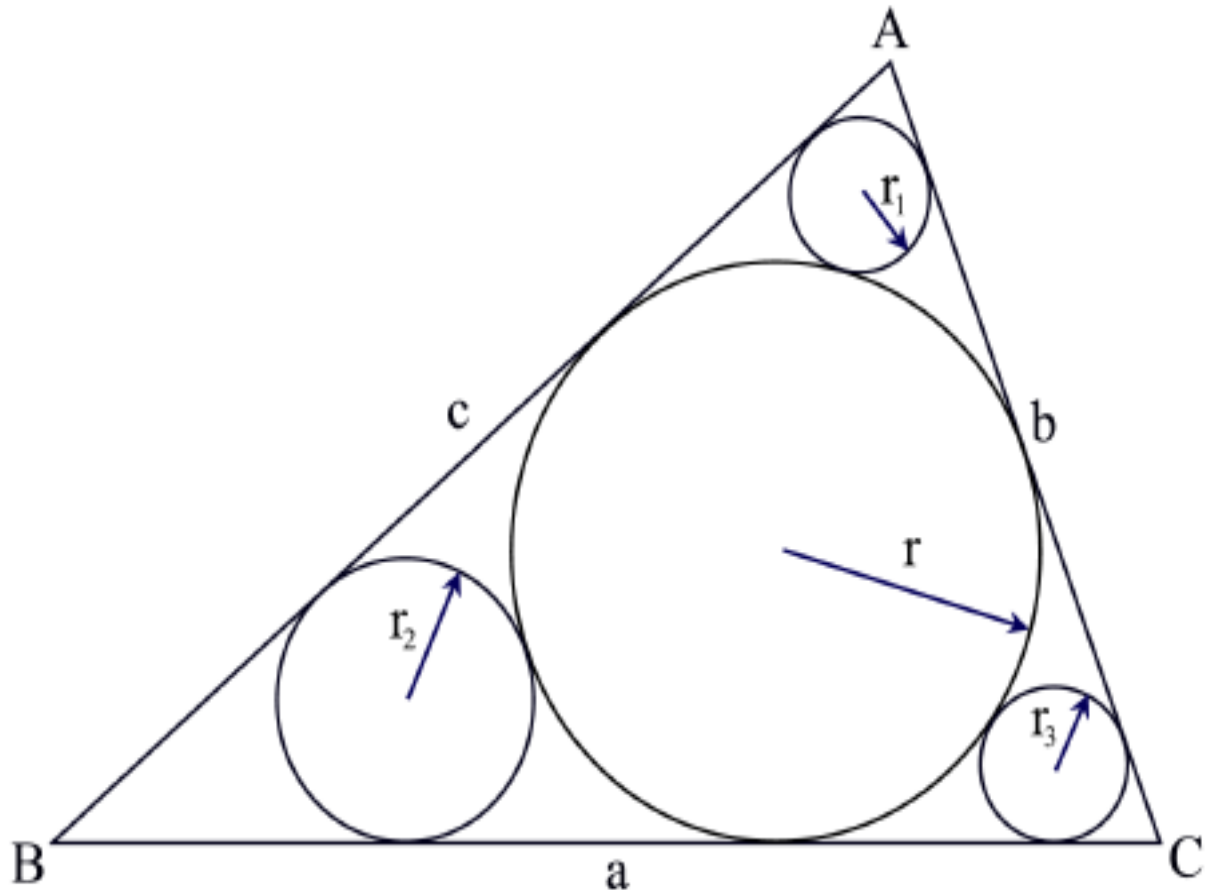




4714 - In-circles Again

Asia - Phuket - 2009/2010

In the figure below you can see triangle ABC and its in--circle (Circle that touches all the sides of a triangle internally). The radius of this in circle is r . Three other circles are drawn. Each of them touches two sides of this triangle and the in circle of ABC. The radii of these circles are r_1 , r_2 and r_3 .



Given the values of r , r_1 , r_2 and r_3 you will have to find the area of triangle ABC.

Input

The input file can contain up to 1000 lines of inputs. Each line contains four positive floating--point numbers which denotes the values of r , r_1 , r_2 and r_3 respectively.

Input is terminated by a line containing four negative integers.

Output

For each line of input produce one line of output. This line contains serial of output followed by a floating--point number which denotes the area of triangle ABC. This floating--point number may have two digits after the decimal point. You can assume that for the given values of r , r_1 , r_2 and r_3 it will always be possible to construct a triangle ABC. If required you can assume that $\pi = 3.141592653589793$ and also use

double precision floating--point numbers for floating--point calculations. You can assume that there will be no such input for which small precision errors will cause difference in printed output. Look at the output for sample input for details.

Sample Input

```
49.1958415692 5.3025839959 20.7869367050 31.8019699761
186.6830516757 71.9474500429 84.8796672233
37.6219288070
-1 -1 -1 -1
```

Sample Output

```
Case 1: 18237.14
Case 2: 195777.32
```

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