

STA Online Computer Programming Contest (DWITE)
December 2002

Problem 4

AREA OF A TRIANGLE

Given 3 points on the Cartesian plane (x_1, y_1) , (x_2, y_2) , and (x_3, y_3) , calculate the area of the triangle enclosed by these three points, if possible.

The input file (DATA4) will contain five lines of data, each line will contain the x and y coordinates of the three points, each separated by a single space in the order: $x_1 y_1 x_2 y_2 x_3 y_3$. The x and y coordinates will be integers, in the range: $-1000 \leq x_1, y_1, x_2, y_2, x_3, y_3 \leq 1000$.

The output file (OUT4) will contain five lines of data. Each line will contain the area of the triangle rounded to 2 decimal places, or, if the 3 points do not form a triangle, output the 2 words NOT POSSIBLE (in uppercase with a space in between).

Hints:

1. $\text{Area} = (\text{base} * \text{height}) / 2$
2. Heron's formula is represented by: $\text{Area} = \text{SQRT}(s*(s-a)*(s-b)*(s-c))$, where $s = (a+b+c)/2$ or perimeter/2; a, b, c are the side lengths.
3. $\text{Area} = (1/2) * (\text{length of one side}) * (\text{length of another side}) * (\text{sine of the included angle})$

Sample Input (Only three lines given)

```
0 2 -2 0 2 0
2 2 3 3 4 4
-1 3 11 60 4 -22
```

Sample Output

```
4.00
NOT POSSIBLE
292.50
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