

problem 6

Triangle Area

4 points

Introduction

One formula for the area of a triangle is:

$$\text{Area} = \frac{a \times b \times \sin w}{2}$$

Where a and b are the lengths of two sides and w is the angle between those same two sides. The angle w can be computed in two steps, first by calculating $\cos w$ using the length c of the third side in this formula:

$$\cos w = \frac{a^2 + b^2 - c^2}{2 \times a \times b}$$

Then use your language's arc-cosine function to compute w .

Java: `Math.acos()`
C++: `acos()`
Python: `math.acos()`
JavaScript: `Math.acos()`

The formula for the distance between two points is

$$d = \sqrt{(x_0 - x_1)^2 + (y_0 - y_1)^2}$$

Input

Each line of input will contain the x and y coordinates (in that order) for three distinct points. The input ends with six zeros.

```
3.1415 2.7777 -3.9123 0.2133 0.4324 -11.111
-8.675309 1.41421 9.999 0.0001 9.999 1.41421
0.7071 7.732 2.718 -1.005 -6.931 0.866025
0.6125 0.03125 99.999 0.9125 99.999 -0.56875
0 0 0 0 0 0
```

Output

For each line the program must print the area of the triangle. Answers should be accurate to within ± 1 of the expected value. For example, if the expected value is 13.2038, any answer between 12.2038 and 14.2038 will be considered correct.

```
45.5104
13.2038
40.2704
73.6081
```

