Polar Coordinates

41/115 challenges solved

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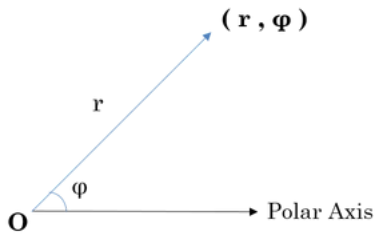
Polar coordinates are an alternative way of representing Cartesian coordinates or Complex Numbers.

A complex number z

$$z = x + yj$$

is completely determined by its real part x and imaginary part y.
Here, j is the imaginary unit.

A polar coordinate (r, φ)



is completely determined by modulus r and phase angle φ.

If we convert complex number z to its polar coordinate, we find:

r: Distance from z to origin, i.e., $\sqrt{x^2 + y^2}$

φ: Counter clockwise angle measured from the positive x-axis to the line segment that joins z to the origin.

Python's cmath module provides access to the mathematical functions for complex numbers.

cmath.phase

This tool returns the phase of complex number z (also known as the argument of z).

```
>>> phase(complex(-1.0, 0.0))
3.1415926535897931
```

abs

This tool returns the modulus (absolute value) of complex number z.

```
>>> abs(complex(-1.0, 0.0))
1.0
```

Task

You are given a complex z. Your task is to convert it to polar coordinates.

Input Format

A single line containing the complex number z. Note: complex() function can be used in python to convert the input as a complex number.

Constraints

Given number is a valid complex number

Output Format

Output two lines:

The first line should contain the value of r.

The second line should contain the value of φ.

Sample Input

```
1+2j
```

Sample Output

```
2.23606797749979
1.1071487177940904
```

Note: The output should be correct up to 3 decimal places.

Change Theme Language Python 3

```
# Enter your code here. Read input from STDIN. Print output to STDOUT
import cmath

c = complex(input())
print(abs(c))
print(cmath.phase(c))

```

EMACS Line: 7 Col: 1

Upload Code as File | Test against custom input | Run Code | Submit Code

You have earned 10.00 points!
41/115 challenges solved.

36%

Congratulations

You solved this challenge. Would you like to challenge your friends?

Next Challenge

- Test case 0
- Test case 1
- Test case 2
- Test case 3
- Test case 4
- Test case 5

Compiler Message

Success

Input (stdin) Download

```
1+2j
```

Expected Output Download

```
2.23606797749979
1.1071487177940904
```