

Polar Coordinates ★

45/115 challenges solved

Rank: 74800 | Points: 485



Your Polar Coordinates submission got 10.00 points.

[Share](#)
[Tweet](#)

[Try the next challenge](#) | [Try a Random Challenge](#)
[Problem](#)
[Submissions](#)
[Leaderboard](#)
[Editorial](#)

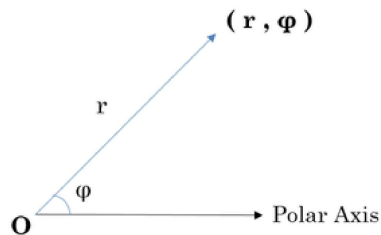
Polar coordinates are an alternative way of representing Cartesian coordinates or [Complex Numbers](#).

A complex number z  Capture.PNG

$$z = x + yj$$

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](#)

Python 3



```
1  import cmath
2
3  def convert_complex_polar_coordinates(complex_number):
4      r = abs(complex_number)
5      phase = cmath.phase(complex_number)
6
7      return r, phase
8
9  if __name__ == '__main__':
10     data = complex(input())
11
12     result = convert_complex_polar_coordinates(data)
13
14     print(round(result[0], 3))
15     print(round(result[1], 3))
16
```

Line: 11 Col: 5

☒ Upload Code as File ☐ Test against custom input

[Run Code](#)[Submit Code](#)

You have earned 10.00 points!

45/115 challenges solved.

39%



Congratulations

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

Next Challenge

Earn a certificate in Python

Kudos on your progress! Take the HackerRank Skills Certification test and enrich your profile

Get Certified

Test case 0

Test case 1

Test case 2

Test case 3

Test case 4

Test case 5

Compiler Message

Success

Input (stdin)

1 1+2j

Download

Expected Output

1 2.23606797749979
2 1.1071487177940904

Download