

Polar Coordinates

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

A complex number z

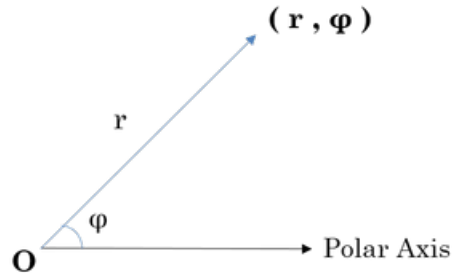
 Capture.PNG

$$z = x + yj$$

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.