

complex numbers

In []:

In [6]: `c = 1+2j`

In [7]: `print(c.real)`

1.0

In [8]: `print(c.imag)`

2.0

In []:

In [1]: `a = 3+4j`
`b = 1+2j`

In [2]: `print(a+b)`

(4+6j)

In [3]: `print(a-b)`

(2+2j)

In [4]: `print(a*b)`

(-5+10j)

In [5]: `print(a/b)`

(2.2-0.4j)

In []:

In [9]: `z = 3+4j`

In [16]: `print(abs(z))` *# magnitude of complex number*

5.0

In [17]: `print(z.conjugate())` *# conjugate of complex number*

(3-4j)

In []:

In []:

In [18]: `import cmath`

```
In [24]: z = 1+3j
```

```
In [25]: print(cmath.phase(z))    # phase angle of complex number  
1.2490457723982544
```

```
In [23]: print(cmath.polar(z))  
  
# polar form of complex number  
#  $z = x + iy$   
#  $z = r \cos\theta + i r \sin\theta = r (\cos\theta + i \sin\theta)$   
#  $r = \sqrt{x^2 + y^2}$   
  
(2.23606797749979, 1.1071487177940904)
```

```
In [26]: print(cmath.sqrt(z))  
  
(1.442615274452683+1.0397782600555705j)
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```