```python
"""
Topic:Mathematical Functions
Summary By: Varpe K. M.
Reference : https://www.geeksforgeeks.org/mathematical-functions-python-set-1-numeric-functions/
"""
"""
In python a number of mathematical operations can be performed
with ease by importing a module named "math" which defines
various functions which makes our tasks easier.


***Numerical functions***

1. ceil() :-
This function returns the smallest integral value greater than the number.
If number is already integer, same number is returned.

2. floor() :-
This function returns the greatest integral value smaller than the number.
If number is already integer, same number is returned.
"""
# Python code to demonstrate the working of
# ceil() and floor()

# importing "math" for mathematical operations
import math

a = 2.3

# returning the ceil of 2.3
print ("The ceil of 2.3 is : ", end="")
print (math.ceil(a))

# returning the floor of 2.3
print ("The floor of 2.3 is : ", end="")
print (math.floor(a))

"""
The ceil of 2.3 is : 3
The floor of 2.3 is : 2



3. fabs() :-
This function returns the absolute value of the number.

4. factorial() :-
This function returns the factorial of the number.
An error message is displayed if number is not integral.
"""

# Python code to demonstrate the working of
# fabs() and factorial()

# importing "math" for mathematical operations
import math

a = -10

b= 5
```

```python
# returning the absolute value.
print ("The absolute value of -10 is : ", end="")
print (math.fabs(a))

# returning the factorial of 5
print ("The factorial of 5 is : ", end="")
print (math.factorial(b))

"""
The absolute value of -10 is : 10.0
The factorial of 5 is : 120
```

5.
copysign(a, b) :-
This function returns the number with the value of 'a' but
with the sign of 'b'. The returned value is float type.

6. gcd() :-
This function is used to compute the greatest common divisor
of 2 numbers mentioned in its arguments.
This function works in python 3.5 and above.
"""

```python
# Python code to demonstrate the working of
# copysign() and gcd()

# importing "math" for mathematical operations
import math

a = -10
b = 5.5
c = 15
d = 5

# returning the copysigned value.
print ("The copysigned value of -10 and 5.5 is : ", end="")
print (math.copysign(5.5, -10))

# returning the gcd of 15 and 5
print ("The gcd of 5 and 15 is : ", end="")
print (math.gcd(5,15))

"""
The copysigned value of -10 and 5.5 is : -5.5
The gcd of 5 and 15 is : 5
```

***Logarithmic and Power Functions ***
1. exp(a) :- This function returns the value of e raised to the power a (e**a) .

2. log(a, b) :- This function returns the logarithmic value of a with base b.
 If base is not mentioned, the computed value is of natural log.
"""
```python
# Python code to demonstrate the working of
# exp() and log()

# importing "math" for mathematical operations
```

```python
import math

# returning the exp of 4
print ("The e**4 value is : ", end="")
print (math.exp(4))

# returning the log of 2,3
print ("The value of log 2 with base 3 is : ", end="")
print (math.log(2,3))

"""
The e**4 value is : 54.598150033144236
The value of log 2 with base 3 is : 0.6309297535714574
```

3. log2(a) :- This function computes value of log a with base 2.
This value is more accurate than the value of the function discussed above.

4. log10(a) :- This function computes value of log a with base 10.
This value is more accurate than the value of the function discussed above.
"""

```python
# Python code to demonstrate the working of
# log2() and log10()

# importing "math" for mathematical operations
import math

# returning the log2 of 16
print ("The value of log2 of 16 is : ", end="")
print (math.log2(16))

# returning the log10 of 10000
print ("The value of log10 of 10000 is : ", end="")
print (math.log10(10000))

"""
The value of log2 of 16 is : 4.0
The value of log10 of 10000 is : 4.0
```

5. pow(a, b) :- This function is used to compute value of a raised to the power b (a**b).

6. sqrt() :- This function returns the square root of the number.
"""

```python
# Python code to demonstrate the working of
# pow() and sqrt()

# importing "math" for mathematical operations
import math

# returning the value of 3**2
print ("The value of 3 to the power 2 is : ", end="")
print (math.pow(3,2))

# returning the square root of 25
print ("The value of square root of 25 : ", end="")
```

```python
print (math.sqrt(25))

"""
The value of 3 to the power 2 is : 9.0
The value of square root of 25 : 5.0
"""
```