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"""
Topic:Mathematical Functions
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Reference : https://www.geeksforgeeks.org/mathematical-functions-python-set-1-numeric-functions/,
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"""

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. sin() :-
This function returns the sine of value passed as argument.
The value passed in this function should be in radians.

2. cos() :-
This function returns the cosine of value passed as argument.
The value passed in this function should be in radians.
"""

# Python code to demonstrate the working of
# sin() and cos()

# importing "math" for mathematical operations
import math

a = math.pi/6
"""
Construction of the angle pi/6=30 degrees produces a 30-60-90 triangle, which has angles theta=p
"""
print(a)
# returning the value of sine of pi/6
print ("The value of sine of pi/6 is : ", end="")
print (math.sin(a))

# returning the value of cosine of pi/6
print ("The value of cosine of pi/6 is : ", end="")
print (math.cos(a))

"""
Output:

The value of sine of pi/6 is : 0.49999999999999994
The value of cosine of pi/6 is : 0.8660254037844387

3. tan() :-
This function returns the tangent of value passed as argument.
The value passed in this function should be in radians.

4. hypot(a, b) :-
This returns the hypotenuse of the values passed in arguments.
Numerically, it returns the value of sqrt(a*a + b*b).
a hypotenuse is the longest side of a right-angled triangle, the side opposite the right angle.
Pythagorean theorem
a^2 + b^2 = c^2
a = side of right triangle
b = side of right triangle
c = hypotenuse
"""

# Python code to demonstrate the working of

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# tan() and hypot()

# importing "math" for mathematical operations
import math

a = math.pi/6
b = 3
c = 4

# returning the value of tangent of pi/6
print ("The value of tangent of pi/6 is : ", end="")
print (math.tan(a))

# returning the value of hypotenuse of 3 and 4
print ("The value of hypotenuse of 3 and 4 is : ", end="")
print (math.hypot(b,c))

```

Output:

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The value of tangent of pi/6 is : 0.5773502691896257
The value of hypotenuse of 3 and 4 is : 5.0

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5. degrees() :-
This function is used to convert argument value from radians to degrees.

6. radians() :-
This function is used to convert argument value from degrees to radians.

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# Python code to demonstrate the working of
# degrees() and radians()

# importing "math" for mathematical operations
import math

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a = math.pi/6
b = 30

# returning the converted value from radians to degrees
print ("The converted value from radians to degrees is : ", end="")
print (math.degrees(a))

# returning the converted value from degrees to radians
print ("The converted value from degrees to radians is : ", end="")
print (math.radians(b))

```

Output:

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The converted value from radians to degrees is : 29.999999999999996
The converted value from degrees to radians is : 0.5235987755982988

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