

Experiment – 6

Aim: Implementing numerical operations using math functions.

Theory:

Math Functions

- The **math** module is used to access mathematical functions in the Python.
- All methods of this functions are used for integer or real type objects, not for complex numbers.
- To use this module, it is required to import this module into a program using import statement:

import math

Objective 1: Write a program to calculate the area of a polygon.

The formula for the area of a regular polygon is given as:

$$A = \frac{l^2 n}{4 \tan(\frac{\pi}{n})}$$

where,

l is the length of the side

n is the number of sides

Program 1:

```
from math import tan, pi
n_sides = int(input("Input number of sides: "))
l_length = float(input("Input the length of a side: "))
p_area = n_sides * (l_length ** 2) / (4 * tan(pi / n_sides))
print("The area of the polygon is: ",p_area)
```

Output:

Input number of sides: 4

Input the length of a side: 20

The area of the polygon is: 400.00000000000006

Objective 2: Program to find the roots of a quadratic function.

Program 2:

```
from math import sqrt

print("Quadratic function : (a * x^2) + b*x + c")
a = float(input("a: "))
b = float(input("b: "))
c = float(input("c: "))

r = b**2 - 4*a*c

if r > 0:
    num_roots = 2
    x1 = ((-b) + sqrt(r))/(2*a)
    x2 = ((-b) - sqrt(r))/(2*a)
    print("There are 2 roots: %f and %f" % (x1, x2))
elif r == 0:
    num_roots = 1
    x = (-b) / 2*a
    print("There is one root: ", x)
else:
    num_roots = 0
    print("No roots, discriminant < 0.")
```

Output:

Quadratic function : (a * x^2) + b*x + c

a: 5

b: 20

c: 10

There are 2 roots: -0.585786 and -3.414214