Aim : Program to Calculate area of triangle, rectangle, Circle.

Theory :

Python is a widely used general-purpose, high-level programming langauage. Python is a popular programming language. It was created by Guido Van Rossum, and released in 1991.

It was designed with an emphasis on code readability & its syntax allow programmers to express their concepts in fewer lines of code. Python is a programming language that lets you work quickly and integrate System more efficiently.

Features in Python :

1. Free and Open Source :

Since it is open-source, this means that source code is also available to the public. So it is freely available for everyone. It has a large community across the world that is dedicatedly working towards make new python modules & function.

2. Expressive language :

Python can Perform complex tasks using a few lines of code. A simple ex : the hello world program you simply type print ("Hello world"). It will take only one line to execute, while Java or C takes multiple lines

3. Interpreted language :

Python is an interpreted language; It means the python program is executed one line at a time. The advantage of being interpreted language, it makes debugging easy & portable.

4. Cross - platform language :

Python can run equally on different platforms such as Windows, Linux, UNIX, and Macintosh, etc. So, we can say that Python is a portable language. It enables programmers to develop the software for several competing platforms by writing a program only once.

5. Object - oriented language :

Python supports object Oriented language & concepts of classes & objects came into existence. It supports inheritance, polymorphism, & encapsulation, etc. The Object - oriented procedure helps to programmer to write reusable code & develop application in less code.

6. Large standard library :

It provides a vast rang of libraries for the various fields such as machine learning, web developer, and also for the scripting. There are various machine learning libraries, such as Tensor flow, Pandas, Numpy, keras, & pytorch etc.

7. GUI Programming Support :

Graphical user Interface is used for the developing Desktop application. PyQT5, Tkinter, Kivy are the libraries which are used for developing the web application.

8. Integrated :

It can be easily integrated with language like C, C++ and JAVA, etc. Python runs code line by line like C, C++ Java. It makes easy to debug the code.

Advantages :

1. Presence of third-part modules.
2. Extensive Support libraries (NumPy for numerical calculations, Pandas for data analytics, etc)
3. User-friendly data structures
4. High-level language
5. Dynamically typed language (No need to mention data type based on the value assigned).

6. Portable & Interactive
7. Ideal for prototypes - provide more functionality with less coding.
8. Versatile, Easy to read, learn & write.

1. Programs:

Program to calculate area of triangle-

```
base = int (input ("Enter base value for triangle"))
height = int (input ("Enter height value for triangle"))
are_of_triangle = 1/2 * base * heigh

print (area_of_triangle)
```

Output:

```
Enter base value for triangle : 12
Enter height value for triangle : 6
36.0
```

Explanation:

User input the integer value for the base & height of a triangle. stores these values in variables "base" and "height" respectively It then calculate the area of the triangle by mutiplying the base & height & dividing the result by 2 and assigns the result to the variable "area_of_triangle" Finally, it prints the calculated area.

2. Program:

Program to calculate are of circle
radius = int (input ("Enter value for radius"))
area_of_circle = 3.14 * radius * radius
print (area_of_rectangle)

Enter value for radius : 5
78.5

Explanation:
The said code calculates the area of circle based on the radius entered by the user. The code uses the "math" module's pi constant & the "input" function to get the radius from the user, then it uses the formula to calculate the area of the circle.

1. The first line from math import pi imports the pi constant from the math module, which is the mathematical constant. It represents the ratio of circle's circumference to its diameter.

2. 3. The second line r = float (input ("Input the radius of the circle : ")). Input () function assigns it to the variable r, it's then cast to float, so the user can input decimal number also.

3. The third line print ("The area of the circle with radius " + str(r) + " is : " + str (pi * r**2)) uses the formula to calculate the area of the circle (pi * r**2). Then it concatenates the string & the value of the radius & area using the + operator & prints the final string.

3. Program:

Calculate the Program of area of rectangle.

```
length = int ( input ("Enter length for rectangle:
breadth = int (input (" Enter breadth for
          rectangle : "))
area_of_rectangle = length * breadth
print (area_of_rectangle)
```

Output

Enter length for rectangle : 30
Enter breadth for rectangle : 45
1350

Explaination:

In Euclidean plane geometry, a rectangle is a quadrilateral with four right angles.
Area of rectangle is the the amount of space occupied by the rectangle. A rectangle can be defined as the plain figure with two adjacent sides equal in length. The 4 angle present in the rectangle are also equal. A rectangle can be divided into 4 Similar Square. The measurement of each interior angle in a rectangle is 90 degree

4). Area of circle using Pi value.

```
Pi = 3.14
r = float (input ("Enter value for radius "))
area_of_circle = Pi * r * r
print (area_of_circle)
```

Output :
Enter Value of radius : 3.14
36.2984

5] // Area of circle using math module.

```
import math as m
area_of_circle = m.pi * r * r
print (area_of_circle).
```

Output

36.3168

Explaination :

First we will import math module which is an inbuild module. We will take the radius an input from the user.

Now, we will calculate the area of circle by using the formula.

The "Pi" is taken from the "math" module and at last, print the area of circle to get the output.

5] Calculate area of circle using function

```
def area_of_circle (radius):
    area = radius ** 2 * pi
    return area
radius = float (input ("Enter radius for circle :")
print ("area of circle :", area of circle (radius))
```

Output :

Enter radius for circle : 8

are of circle : 200.96

Explanation:
In this code, I have defined a function as def area of circle (radius)
We can stores the value Pi = 3.14 which is fixed.
The function is returned as return are.
The function area of circle (radius) is called and it will print the output.

7. //Calculate area of rectangle using Function

```
def area_of_rectangle (l, b)
    area = l * b
    l = float ( input ( "Enter length:"))
    b = float (input ("Enter breadth:")
print ("area of rectangle", area of rectangle
                (l, b))
```

Output :

```
Enter length : 15
Enter breadth: 18
area of rectangle : 270.0
```

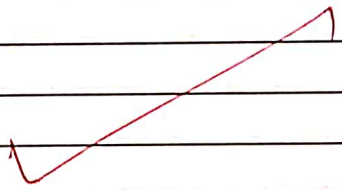
Explanation : Firstly, we will calculate the area of a rectangle inside the function by using the formula, Area = length * breadth. The user will enter the length & breadth of a rectangle & we will pass these values to function arguments.
~~values to function argu~~ At last, print the area of rectangle to see the output.

Conclusion.:

In this experiment we have to find area of rectangle, triangle & circle. For rectangle we used function & pt direct printing output also for triangle. For circle we founded

① direct formula
② By using function
③ import math module & get pi value.

Here we conclude that we can understand how to use this functions in python & how inport module in pt.



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Run Code

```
Enter value for radius5
78.5
```

In [8]:
```
pi=3.14
r=float(input("Enter value for radius"))
area_of_circle=pi*r*r
print(area_of_circle)
```

```
Enter value for radius3.4
36.2984
```

In [9]:
```
import math as m
area_of_circle=m.pi*r*r
print(area_of_circle)
```

```
36.31691107549801
```

In [20]:
```
def area_of_rectangle(l,b):
    area=l*b
    return area
l=float(input("Enter length:"))
b=float(input("Enter breadth:"))
print("area of rectangle",area_of_rectangle(l,b))
```

```
Enter length:15
Enter breadth:18
area of rectangle 270.0
```

In [25]:
```
def area_of_circle(radius):
    area=radius**2*pi
    return area
radius=float(input("Enter radius for circle:"))
print("area of circle:", area_of_circle(radius))
```

```
Enter radius for circle:8
area of circle: 200.96
```

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Run Code

In [1]:
```
print("hii...")
```
```
hii...
```

In [3]:
```
base=int(input("Enter base value for triangle:"))
height=int(input("Enter height value for triangle:"))
area_of_triangle=1/2*base*height
print(area_of_triangl)
```
```
Enter base value for triangle:12
Enter height value for triangle:6
36.0
```

In [6]:
```
length=int(input("Enter length for rectangle:"))
breadth=int(input("Enter breadth for rectangle:"))
area_of_rectangle=length*breadth
print(area_of_rectangle)
```
```
Enter length for rectangle:30
Enter breadth for rectangle:45
1350
```

In [7]:
```
radius=int(input("Enter value for radius"))
area_of_circle=3.14*radius*radius
print(area_of_circle)
```
```
Enter value for radius5
78.5
```

In [8]:
```
pi=3.14
r=float(input("Enter value for radius"))
area_of_circle=pi*r*r
print(area_of_circle)
```
```
Enter value for radius3.4
```