

1. ****Area of a Square****

Write a program that takes the side length of a square as input and prints its area.

```
a=float(input("Enter length of square: "))
area= a**2
print("Area of square is: ", area)
```

2. ****Area of a Rectangle****

Input width and height. Calculate the area.

```
width= float(input("Enter width of rectangle: "))
height= float(input("Enter height of rectangle: "))
area= height * width
print("Area of Rectangle:", area)
```

3. ****Area of a Circle****

radius. Use $\pi = 3.14$ to find the area.

```
radius= float(input("Enter radius of circle: "))
pi= 3.14
area= pi * radius**2
print("Area of Circle: ", area)
```

4. ****Area of a Triangle (Base \times Height)****

Input base and height; find the area.

```
base= float(input("Enter base of triangle:"))
height= float(input("Enter height of tringle:"))
area= (base * height) / 2
print("Area of Triangle:", area)
```

5. ****Area of a Parallelogram****

Input base and vertical height.

```
base= float(input("Enter base of parallelogram: "))
height= float(input("Enter height of parallelogram: "))
area= base * height
print("Area of Parallelogram: ", area)
```

6. ****Area of a Rhombus****

Input diagonals d1 and d2.

```
d1= float(input("Enter length of first diagonal of rhombus: "))
d2= float(input("Enter length of second diagonal of rhombus: "))
area= (d1 * d2) / 2
print("Area of Rhombus: ", area)
```

```
# 7. **Area of a Trapezium**
```

```
# Input parallel sides a, b and height h.
```

```
a= float(input("Enter length of first parallel side of trapezium: "))
b= float(input("Enter length of second parallel side of trapezium: "))
h= float(input("Enter height of trapezium: "))
area= ((a + b) / 2) * h
print("Area of Trapezium: ", area)
```

```
# 8. **Area of a Isosceles Triangle**
```

```
# Input equal sides and base; use suitable formula.
```

```
import math
a = float(input("Enter length of equal sides of isosceles triangle: "))
b = float(input("Enter length of base of isosceles triangle: "))
height = math.sqrt(a**2 - (b**2 / 4))
area = (b * height) / 2
print("Area of Isosceles Triangle: ", area)
```

```
# 9. **Area of a Right-angled Triangle**
```

```
# Input perpendicular and base.
```

```
perpendicular = float(input("Enter length of perpendicular side of right-angled triangle: "))
base = float(input("Enter length of base side of right-angled triangle: "))
area = (perpendicular * base) / 2
print("Area of Right-angled Triangle: ", area)
```

```
# 10. **Area of a Circle (User chooses  $\pi$ )**
```

```
# Ask user: "Enter  $\pi$  as 3.14 or 22/7", then compute.
```

```
radius = float(input("Enter the radius of the circle: "))
pi_choice = input("Enter  $\pi$  as 3.14 or 22/7: ")

if pi_choice == "3.14":
    pi = 3.14
elif pi_choice == "22/7":
    pi = 22 / 7
else:
    print("Invalid choice for  $\pi$ . Please enter either 3.14 or 22/7.")
    exit()

area = pi * radius * radius
print("Area of Circle: ", area)
```

```

# 11. **Menu-Driven Area Calculator**
# Show menu of shapes; compute area based on user choice.

while True:
    print("\n--- Area Calculator Menu ---")
    print("1. Area of Circle")
    print("2. Area of Rectangle")
    print("3. Area of Triangle")
    print("4. Area of Square")
    print("5. Exit")

    choice = input("\nChoose a shape (1-5): ")

    match choice:
        case "1":
            radius = float(input("Enter the radius of the circle: "))
            pi_choice = input("Enter  $\pi$  as 3.14 or 22/7: ")

            match pi_choice:
                case "3.14":
                    pi = 3.14
                case "22/7":
                    pi = 22 / 7
                case _:
                    print("Invalid  $\pi$  choice. Try again.")
                    continue

            area = pi * radius * radius
            print("Area of Circle:", area)

        case "2":
            length = float(input("Enter the length of the rectangle: "))
            width = float(input("Enter the width of the rectangle: "))
            area = length * width
            print("Area of Rectangle:", area)

        case "3":
            base = float(input("Enter the base of the triangle: "))
            height = float(input("Enter the height of the triangle: "))
            area = 0.5 * base * height
            print("Area of Triangle:", area)

        case "4":
            side = float(input("Enter the side of the square: "))
            area = side * side
            print("Area of Square:", area)

        case "5":
            print("Exiting the program... Goodbye!")
            break

```

```
case _:
    print("Invalid choice. Please select a valid option.")
```

```
# 12. **Area of Circle with Math Library**
# Use `math.pi` instead of constant 3.14.
```

```
import math
```

```
radius = float(input("Enter radius: "))
area = math.pi * math.pow(radius, 2)
print(f'Area of Circle = {area:.2f}')
```

```
# 13. **Calculate Cost Based on Area**
# A painter charges ₹10 per sq.ft; find total cost for a rectangular wall.
```

```
length = float(input("Enter length of wall (in ft): "))
breadth = float(input("Enter breadth of wall (in ft): "))

area = length * breadth
cost_per_sqft = 10
total_cost = area * cost_per_sqft
print("Total cost to paint the wall", total_cost)
```

```
# 14. **Garden Plot Area**
# A rectangular garden has a circular fountain cut out in the center. Find the remaining area.
```

```
import math
```

```
# Input dimensions
length = float(input("Enter garden length (m): "))
width = float(input("Enter garden width (m): "))
radius = float(input("Enter fountain radius (m): "))
```

```
# Areas
rect_area = length * width
circle_area = math.pi * (radius ** 2)
```

```
# Remaining area
remaining_area = rect_area - circle_area
```

```
# Output
print("Garden area (rectangle):", rect_area)
print("Fountain area (circle):", circle_area)
print("Remaining area:", remaining_area)
```

```
# 15. **Room Flooring Calculator**  
# Given room dimensions and tile area, find number of tiles needed.
```

```
import math
```

```
# Input room dimensions  
room_length = float(input("\nEnter length of the room: "))  
room_width = float(input("Enter width of the room: "))
```

```
# Input tile dimensions  
tile_length = float(input("Enter length of a tile: "))  
tile_width = float(input("Enter width of a tile: "))
```

```
# Calculate areas  
room_area = room_length * room_width  
tile_area = tile_length * tile_width
```

```
# Calculate number of tiles (rounded up)  
tiles_needed = math.ceil(room_area / tile_area)
```

```
print("\nRoom Area: ", room_area, "Sq Units")  
print("Tile Area: ", tile_area, "Sq Units")  
print("Number of Tiles Needed: ", tiles_needed, "\n")
```

```
# 16. **Area of Polygon (User enters number of sides & side length)**  
# Use formula for regular polygon.
```

```
import math
```

```
# Input from user  
print("\n** Sides must be equal or Greaterthan 3 **")  
n = int(input("Enter number of sides: "))  
a = float(input("Enter side length: "))
```

```
# Area calculation  
area = (n * (a ** 2)) / (4 * math.tan(math.pi / n))
```

```
# Output  
print("Area of regular polygon:", area)
```

```
# 17. **Land Area Converter**  
# Input land dimensions in meters; output area in sq.m, sq.ft, and acres.
```

```
# Input dimensions in meters  
length = float(input("\nEnter length in meters: "))  
width = float(input("Enter width in meters: "))
```

```
# Area in square meters
area_m2 = length * width

# Convert to square feet (1 m² = 10.7639 ft²)
area_ft2 = area_m2 * 10.7639

# Convert to acres (1 acre = 4046.8564224 m²)
area_acres = area_m2 / 4046.8564224

# Output results
print("\nArea in square meters:", area_m2)
print("Area in square feet:", area_ft2)
print("Area in acres:", area_acres, "\n")
```

```
# 21. **Area of Sector of a Circle**
# Input radius and angle (in degrees or radians).

import math

radius= float(input("\nEnter radius of circle: "))
degree= float(input("Enter angle in degree: "))

# Area using degree formula
area= (degree/360) * math.pi * (radius**2)
print(f'Area of Sector: {round(area, 2)}°')
```

```
# 22. **Paint Area Calculator**
# Calculate wall area excluding windows and doors.

wall_len= float(input("\nEnter Length of wall: "))
wall_wid= float(input("Enter Width of wall: "))
door_len= float(input("Enter length of door:"))
door_wid= float(input("Enter width of door:"))
window_height= float(input("Enter window height: "))
window_width= float(input("Enter window width: "))

wall_area= wall_len * wall_wid

door_area= door_len * door_wid
window_area= window_height * window_width

Total_area= wall_area - (door_area + window_area)

print("Area of Wall: ", wall_area, "meter")
print("Area of Door: ", door_area, "meter")
print("Area of Window: ", window_area, "meter")
print("Total Wall Area to paint: ", Total_area, "meter\n")
```

```
# 23. **Area of Oval (Ellipse)**
# Input two radii a and b; area =  $\pi ab$ .

import math

# input radii values
a= float(input("\nEnter semi-major radii (a): "))
b= float(input("Enter semi-minor radii (b): "))

# Calculating Area of Ellipse
area= math.pi * a * b

# output
print("Area of Oval(Ellipse): ", round(area, 2), "\n")
```

```
# 24. **Area of a Kite**
# Use diagonal-based formula.

# Input values
d1= float(input("\nEnter first diagonal (d1): "))
d2= float(input("Enter second diagonal (d2): "))

# Calculating Area of Kite
area= 0.5 * d1 * d2

# Output
print("Area of Kite: ", round(area, 2), "\n")
```

```
# 25. **Area of Triangle using Heron's Formula**
# Input 3 sides and compute area.

import math

# input values
a= float(input("\nEnter first side (a): "))
b= float(input("Enter second side (b): "))
c= float(input("Enter third side (c): "))

# Evaluating Semi-Parameter
s= (a+b+c)/2

# Calculating Area Using Heron's Formula
area= math.sqrt(s*(s-a)*(s-b)*(s-c))

# Output
print("Area of Triangle: ", round(area, 2), "\n")
```

CONVERSION PROBLEMS:

```
# 1. **Celsius to Fahrenheit Converter**
# Input temperature in °C and convert to °F.

# Input Value
c= float(input("\nEnter temperature in celsius: "))

# Convert Celsius to Fahrenheit
f= ((9/5) * c) + 32

# Output
print(f'Your Temperature in Fahrenheit: {round(f,2)}°F')
```

```
# 2. **Kilometers to Meters & Centimeters**
# Input distance in km; display meters and centimeters.

# Input Distance in Kilometer
km= float(input("Enter distance in kilometer: "))

# Conversion
meter= km * 1000
centimeter= meter * 100

# Output
print("Distance in Meter: ", round(meter, 2),"m")
print("distance in Centimeter: ", round(centimeter, 2),"cm")
```

```
# 3. **Minutes to Hours**
# Input total minutes; convert into hours and remaining minutes.

# Input Total Minutes
minute= int(input("\nEnter total minutes: "))

# Minues to Hours
hour= minute // 60
remaining_minutes= minute % 60

# Output
print(hour,"Hour", remaining_minutes,"Minutes\n")
```

```
# 4. **Grams to Kilograms**
# Convert given weight in grams to kilograms.

# Input weight in grams
grams = float(input("\nEnter weight in grams: "))

# Conversion
```



```
kilograms = grams / 1000
```

```
# Output
```

```
print("Weight in kilograms:", round(kilograms, 2),"Kg\n")
```

```
# 5. Meters to Feet
```

```
# Convert given length in meters to feet.
```

```
# Input Length in Meters
```

```
meters= float(input("\nEnter length in meter: "))
```

```
# Convert Meter into Feet
```

```
feet= meters * 3.28084
```

```
# Output
```

```
print("Length in Feet: ", round(feet, 2),"ft\n")
```

```
# 6. Liters to Milliliters
```

```
# Convert liquid quantity from L to mL.
```

```
# Input liquid quantity in liters
```

```
liters = float(input("\nEnter quantity in liters: "))
```

```
# Conversion
```

```
milliliters = liters * 1000
```

```
# Output
```

```
print("Quantity in milliliters:", round(milliliters, 2),"ml\n")
```

```
# 7. Fahrenheit to Kelvin
```

```
# Convert using formula  $K = (F - 32) \times 5/9 + 273.15$ .
```

```
# Input Temperature in Fahrenheit
```

```
fahrenheit= float(input("\nEnter temperature in fahrenheit: "))
```

```
# Conversion
```

```
kelvin= (fahrenheit - 32) * (5/9) + 273.15
```

```
# Output
```

```
print("Temperature in Kelvin: ", round(kelvin, 2),"°K\n")
```

```
# 8. **Rupees to Paise**
# Convert rupees to paise.

# Input amount in rupees
rupees = float(input("\nEnter amount in rupees: "))

# Conversion
paise = rupees * 100

# Output
print("Amount in paise:", round(paise, 2),"Paisa\n")
```

```
# 9. **Days to Weeks and Days**
# Input number of days; convert to weeks + extra days.

# Input total days
days = int(input("\nEnter number of days: "))

# Conversion
# integer division
weeks = days // 7
# remainder
extra_days = days % 7

# Output
print(weeks,"Weeks", extra_days,"Extra days\n")
```

```
# 10. **Simple Speed Conversion**
# Convert speed from km/h to m/s.

# Input speed in km/h
kmph = float(input("\nEnter speed in km/h: "))

# Conversion
mps = kmph / 3.6

# Output
print("Speed:", round(mps, 2),"m/s\n")
```