

#### # 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 triangle:"))
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 π)**
```

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

```
radius = float(input("Enter the radius of the circle: "))
```

```
pi_choice = input("Enter π 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 π. 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 π as 3.14 or 22/7: ")  
  
            match pi_choice:  
                case "3.14":  
                    pi = 3.14  
                case "22/7":  
                    pi = 22 / 7  
                case _:  
                    print("Invalid π 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 = πab.

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: "))  
  
# Minutes 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) × 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")
```