CODE

import java.util.Scanner;

abstract class Shape {

    protected int dimension1;

    protected int dimension2;

    // Constructor to initialize dimensions

    public Shape(int dimension1, int dimension2) {

        this.dimension1 = dimension1;

        this.dimension2 = dimension2;

    }

    // Abstract method to print the area

    public abstract void printArea();

}

class Rectangle extends Shape {

    public Rectangle(int width, int height) {

        super(width, height);

    }

    @Override

    public void printArea() {

        int area = dimension1 \* dimension2; // width \* height

        System.out.println("Area of Rectangle: " + area);

    }

}

class Triangle extends Shape {

    public Triangle(int base, int height) {

        super(base, height);

    }

    @Override

    public void printArea() {

        double area = 0.5 \* dimension1 \* dimension2; // 0.5 \* base \* height

        System.out.println("Area of Triangle: " + area);

    }

}

class Circle extends Shape {

    public Circle(int radius) {

        super(radius, 0); // dimension2 is not used for Circle

    }

    @Override

    public void printArea() {

        double area = Math.PI \* dimension1 \* dimension1; // π \* radius^2

        System.out.println("Area of Circle: " + area);

    }

}

class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        System.out.println("Choose a shape to calculate the area (1: Rectangle, 2: Triangle, 3: Circle): ");  
        int choice = scanner.nextInt();  
  
        Shape shape = null;  
  
        switch (choice) {  
            case 1:  
                System.out.print("Enter width of the rectangle: ");  
                int width = scanner.nextInt();  
                System.out.print("Enter height of the rectangle: ");  
                int height = scanner.nextInt();  
                shape = new Rectangle(width, height);  
                break;  
  
            case 2:  
                System.out.print("Enter base of the triangle: ");  
                int base = scanner.nextInt();  
                System.out.print("Enter height of the triangle: ");  
                int triangleHeight = scanner.nextInt();  
                shape = new Triangle(base, triangleHeight);  
                break;  
  
            case 3:  
                System.out.print("Enter radius of the circle: ");  
                int radius = scanner.nextInt();  
                shape = new Circle(radius);  
                break;  
  
            default:  
                System.out.println("Invalid choice.");  
                break;  
        }  
  
        if (shape != null) {  
            shape.printArea();  
        }  
  
        scanner.close();  
    }  
}

OUTPUT









