```java
import java.util.Scanner;
abstract class Shape {
    int  dim1;
    int dim2;

    Shape(int dim1, int dim2) {
        this.dim1 = dim1;
        this.dim2 = dim2;
    }

    abstract void printArea();
}
class Rectangle extends Shape {
    Rectangle(int length, int width) {
        super(length, width);
    }

    void printArea() {
        int area = dim1 * dim2;
        System.out.println("Area of Rectangle: " + area);
    }
}
class Triangle extends Shape {
    Triangle(int base, int height) {
        super(base, height);
    }

    void printArea() {
        double area = 0.5 * dim1 * dim2;
        System.out.println("Area of Triangle: " + area);
    }
}
class Circle extends Shape {
    public Circle(int radius) {
        super(radius, 0);
```

```java
        }

    public void printArea() {
        double area = Math.PI * dim1 * dim1;
        System.out.println("Area of Circle: " + area);
    }
}

class Calc {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Select a shape:");
        System.out.println("1. Rectangle");
        System.out.println("2. Triangle");
        System.out.println("3. Circle");

        int choice = scanner.nextInt();
        Shape shape=null;
        switch (choice) {
            case 1:
                System.out.println("Enter length of rectangle:");
                int length = scanner.nextInt();
                System.out.println("Enter width of rectangle:");
                int width = scanner.nextInt();
                shape = new Rectangle(length, width);
                break;
            case 2:
                System.out.println("Enter base of triangle:");
                int base = scanner.nextInt();
                System.out.println("Enter height of triangle:");
                int height = scanner.nextInt();
                shape = new Triangle(base, height);
                break;
            case 3:
```

```java
            System.out.println("Enter radius of circle:");
            int radius = scanner.nextInt();
            shape = new Circle(radius);
            break;
        default:
            System.out.println("Invalid choice");
            return;
    }

    shape.printArea();

      }

}
```

```
C:\1BM23CS316>java Calc
Select a shape:
1. Rectangle

2. Triangle
3. Circle
1

Enter length of rectangle:
12
Enter width of rectangle:
11
Area of Rectangle: 132


C:\1BM23CS316>java Calc
Select a shape:
1. Rectangle
2. Triangle
3. Circle
2
Enter base of triangle:
12
Enter height of triangle:
12
Area of Triangle: 72.0


C:\1BM23CS316>java Calc
Select a shape:
1. Rectangle
2. Triangle
3. Circle
3

Enter radius of circle:
12
Area of Circle: 452.3893421169302

C:\1BM23CS316>
```

Lab Program - 4.

Q) Develop a Java program to create an
abstract class named shape that
contains 2 integers and an empty
method named printArea().
Provide three classes named rectangle,
triangle and circle such that each one
of the classes extends the class shape.
Each one of the classes contains only.
the method printArea() that prints the
area of the given shape,

```java
abstract class Shape {
    int x, y;
    void printArea() {}
}

class Rectangle extends Shape {
    Rectangle (int length, int breadth) {
        this.x = length;
        this.y = breadth;
    }

    void printArea() {
        int area = x * y;
        System.out.println(" Area of
        rectangle:" + area);
    }
}

class Triangle extends Shape {
    Triangle (int base, int height) {
```

```java
        this.x = base;
        this.y = height;
    }
    void printArea(){
        double area = 0.5 * x * y;
        System.out.println("Area of
            triangle:" + area);
    }
}
class Circle extends Shape {
    Circle (int radius){
        this.x = radius
    }
    void printArea(){
        double area = Math.PI * radius
                        * radius;
        System.out.println("Area of circle:" +
            area);
    }
}
class main {
    public static void main (String[] args){
        Shape r = new Rectangle (10,5);
        Shape t = new Triangle (6,8);
        Shape c = new Circle (7);
        r.printArea();
        t.printArea();
        c.printArea();
    }
}
```

Output:

Area of ~~red~~ rectangle: 50
Area of triangle : 24.00.
Area of circle : 153.98380400258