

NAME: DEEPAK SHITOLE  
MIS NO: 642303019

SUBJECT: PPL  
ASSIGNMENT NO:-06

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**PROGRAM:**

```
#include <iostream>
#include <cmath>
```

```
using namespace std;
```

```
class Shape {
public:
    virtual double area() const = 0;
};
```

```
class Circle : public Shape {
private:
    double radius;

public:
    Circle(double r) : radius(r) {}

    double area() const override {
        return M_PI * radius * radius;
    }
};
```

```
class Triangle : public Shape {
private:
    double side1, side2, side3;

public:
    Triangle(double s1, double s2, double s3) : side1(s1), side2(s2),
    side3(s3) {}
};
```

```
double area() const override {  
    double s = (side1 + side2 + side3) / 2;  
    return sqrt(s * (s - side1) * (s - side2) * (s - side3));  
}  
};
```

```
class Square : public Shape {  
private:  
    double side;  
  
public:  
    Square(double s) : side(s) {}  
  
    double area() const override {  
        return side * side;  
    }  
};
```

```
class Polygon : public Shape {  
protected:  
    int sides;  
    double sideLength;  
  
public:  
    Polygon(int s, double length) : sides(s), sideLength(length) {}  
  
    double area() const override {  
        return (sides * sideLength * sideLength) / (4 * tan(M_PI / sides));  
    }  
};
```

```
class Octagon : public Polygon {  
public:  
    Octagon(double sideLength) : Polygon(8, sideLength) {}  
};
```

```
int main() {  
double radius, side1, side2, side3, squareSide, polygonSide,  
octagonSide;  
  
cout << "Enter the radius of the circle: ";  
cin >> radius;  
  
cout << "Enter the three side lengths of the triangle: ";  
cin >> side1 >> side2 >> side3;  
  
cout << "Enter the side length of the square: ";  
cin >> squareSide;  
  
cout << "Enter the number of sides for the polygon: ";  
cin >> polygonSide;  
  
cout << "Enter the side length of the octagon: ";  
cin >> octagonSide;  
  
Circle circle(radius);  
Triangle triangle(side1, side2, side3);  
Square square(squareSide);  
Polygon polygon(polygonSide, 4.0);  
Octagon octagon(octagonSide);  
  
cout << "Circle Area: " << circle.area() << endl;  
cout << "Triangle Area: " << triangle.area() << endl;  
cout << "Square Area: " << square.area() << endl;  
cout << "Polygon Area: " << polygon.area() << endl;  
cout << "Octagon Area: " << octagon.area() << endl;  
  
return 0;  
}
```

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## OUTPUT:

```
PS C:\Users\DeepakS> cd "d:\B. Tech\PPL\Assignment6"
PS D:\B. Tech\PPL\Assignment6> cd "d:\B. Tech\PPL\Assignment6\"
Enter the radius of the circle: 6
Enter the three side lengths of the triangle: 2 4 5
Enter the side length of the square: 5
Enter the number of sides for the polygon: 6
Enter the side length of the octagon: 8
Circle Area: 113.097
Triangle Area: 3.79967
Square Area: 25
Polygon Area: 41.5692
Octagon Area: 309.019
PS D:\B. Tech\PPL\Assignment6> |
```