```cpp
//
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// C/C++ Programming III : Intermediate Programming with Objects
// 151116  Raymond L. Mitchell III
// Complex.cpp
// Win10
// Visual C++ 19.0
//
// File contains the member functions for Circle, Square, Sphere and Cube class
//

#include <iostream>
#include "Shape.h"

using std::cout;

const double  PI = 3.14159265358979323846;

using ShaunChemplavil::Shape;
using ShaunChemplavil::TwoDimensionalShape;
using ShaunChemplavil::ThreeDimensionalShape;

using ShaunChemplavil::Circle;
using ShaunChemplavil::Square;
using ShaunChemplavil::Sphere;
using ShaunChemplavil::Cube;

// Default Constructor
Circle::Circle(double radius)
   : radius(radius) {}

double Circle::getArea() const
{
   // area = pi*radius^2
   return (radius * radius * PI);
}

void Circle::display() const
{
   cout << "Circle with radius " << radius << " has area " << getArea() << "\n";
}

// Default Constructor
Square::Square(double lengthOfSide)
   : lengthOfSide(lengthOfSide) {}

double Square::getArea() const
{
   // area = lengthOfSide^2
   return (lengthOfSide * lengthOfSide);
}
```

```
53
54 void Square::display() const
55 {
56    cout << "Square with length of side " << lengthOfSide
57       << " has area " << getArea() << "\n";
58 }
59
60 Sphere::Sphere(double radius)
61    : radius(radius) {}
62
63 double Sphere::getSurfaceArea() const
64 {
65    // surface area = 4*pi*r^2
66    return (4.0 * PI * radius * radius);
67 }
68
69 double Sphere::getVolume() const
70 {
71    // volume = 4/3*pi*r^3
72    return (getSurfaceArea() * radius / 3.0);
73 }
74
75 void Sphere::display() const
76 {
77    cout << "Sphere with radius " << radius << " has area "
78       << getSurfaceArea() << " and volume " << getVolume() << "\n";
79 }
80
81 // Default Constructor
82 Cube::Cube(double lengthOfSide)
83    : lengthOfSide(lengthOfSide) {}
84
85 double Cube::getSurfaceArea() const
86 {
87    // surface area = 6*lengthofSide^2
88    return (lengthOfSide * lengthOfSide * 6.0);
89 }
90
91 double Cube::getVolume() const
92 {// surface area = lengthofSide^3
93    return (lengthOfSide * lengthOfSide * lengthOfSide);
94 }
95 void Cube::display() const
96 {
97    cout << "Cube with length of side " << lengthOfSide << " has area " <<
       getSurfaceArea()
98       << " and volume " << getVolume() << "\n";
99 }
100
```