#include<iostream>

#include<cmath>

const double PI = 3.14159265358979323846;

class Geometry {

public:

// Function to calculate the area of a circle

double area(double radius) {

return PI \* radius \* radius;

}

// Function to calculate the area of a sphere

double area(double radius, char type) {

if (type == 's') {

return 4 \* PI \* radius \* radius;

} else {

std::cerr << "Invalid type for sphere calculation.\n";

return 0.0;

}

}

// Function to calculate the area of a cone

double area(double radius, double height) {

return PI \* radius \* (radius + sqrt(radius \* radius + height \* height));

}

};

int main() {

Geometry geometry;

// Calculate and display the area of a circle

double circleRadius = 5.0;

std::cout << "Area of circle with radius " << circleRadius << ": " << geometry.area(circleRadius) << std::endl;

// Calculate and display the area of a sphere

double sphereRadius = 3.0;

std::cout << "Area of sphere with radius " << sphereRadius << ": " << geometry.area(sphereRadius, 's') << std::endl;

// Calculate and display the area of a cone

double coneRadius = 4.0;

double coneHeight = 6.0;

std::cout << "Area of cone with radius " << coneRadius << " and height " << coneHeight << ": " << geometry.area(coneRadius, coneHeight) << std::endl;

return 0;

}