**Introduction to Programming**

**SADITM** for \_\_surface area SADITM\_\_\_\_

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**Specification of the Problem:** Develop a solution to find the area of a sphere. Output the radius and area.

**Analysis**: Data Requirements (Include libraries that will need to be imported and primitive data types of all variables)

**Narrative: Prompt** for *radius.* **Read** *radius*. **Compute** *surfaceArea*. **Output** *radius.* ***Output*** *surfaceArea.*

**External Files to Include/Import**: stdio.h

**Input variables**: double *radius*

**Output variables**: double *radius,* double *surfaceArea*

**Program Variables:** None

**Constants**: PI=3.14159

**Formulas:** *surfaceArea = 4\**PI*\*radius\*radius*

**Design**: Algorithm (include Program Variables to store intermediate results, if any)

**Algorithm**:

**Prompt** with: “Please enter the radius: “.

**Read** *radius*.

**Compute** *surfaceArea = 4\**PI*\*radius\*radius*

**Output** *“*Your radius is “+*radius*

***Output***“The surface area of your sphere is “+*surfaceArea*

**Algorithm for other Methods / Functions:**

**Test Cases**: At least three test cases

Nominal Cases

1. *radius = 4 (positive integer case)*

Your radius is 4

The surface area of your sphere is 201.06176

1. *radius = 3.2 (positive floating point case)*

Your radius is 3.2

The surface area of your sphere is 128.6144

Fringe Cases

1. *radius = 0 (zero case)*

Your radius is 0

The surface area of your sphere is 0

1. *radius = -2.3 (negative floating point case)*

Your radius is -2.3

The surface area of your sphere is 66.4424

1. *radius = -1 (negative integer case)*

Your radius is -1

The surface area of your sphere is 12.56636