Task – Write a program that calculates area, perimeter, volume, lateral area, and surface area of various shapes, including Circles, Cylinders, Rectangles, Rectangular Prisms, Spheres, Triangles, and Triangular Prisms.

Objects:

Circle – Defined by Radius

Cylinder – Defined by Radius and Height

Rectangle – Defined by Length and Width

Rectangular Prism – Defined by Length, Width, and Height

Sphere – Defined by Radius

Triangle – Defined by length of each of the three sides

Triangular Prism – Defined by length of each other the three sides and a Height

Formulas:

Circle:

Area = radius \* radius \* PI

Perimeter = 2 \* radius \* PI

Rectangle:

Area = length \* width

Perimeter = 2 \* (length + width)

Triangle:

s = (side1 + side2 + side3)/2

Area = Math.sqrt(s \* (s-side1) \* (s-side2) \* (s-side3))

Perimeter = side1 + side2 + side3

Cylinder, Rectangular Prism, Triangular Prism:

Volume = areaOfBase \* height

Lateral Area = perimeterOfBase \* height Surface Area = lateralArea + (2 \* areaOfBase)

Sphere:

Surface Area = 4 \* PI \* radius \* radius

Volume = 4/3 \* PI \* radius \* radius \* radius

Program:

1. Get input – Either length, width, height, radius, or side dimensions
2. Instantiate different shape objects
3. Ask the different shapes to compute either Area, Circumference, Volume, Perimeter, Lateral Area, or Surface Area
4. Display results (using JOptionPane)