MAT1575 Module 10 – Riemann sums for volumes and surface area.

Objectives: Modify and apply the algorithm from module 9 to approximate the volume and surface area of certain shapes.

1. Test your modified work from module 9 against the following examples:
   (a) Approximate the volume and surface area of a sphere of radius 1.
   (b) Approximate the volume and surface area (not including the bottom) of a cone with radius 2 and height 3.
   (c) Approximate the ratio of the volume of a cone with radius and height x with the volume of a cylinder with radius and height x for various choices of x.
   (d) Approximate the volume and surface area of the solid formed by revolving $f(x) = \dfrac{1}{x^2}$ around the y-axis on the interval $[1, \infty)$. (Hint: This shape is known as Gabriel's Horn. You will approximate improper integrals that might not converge.)