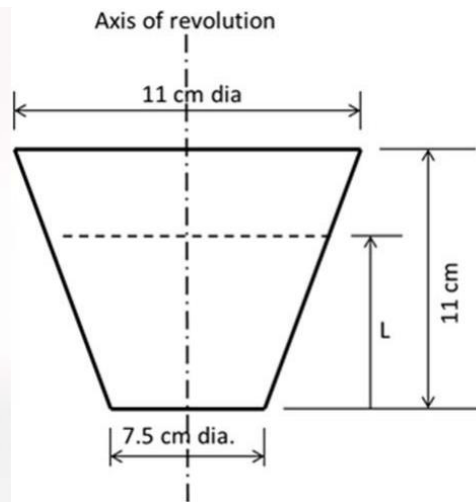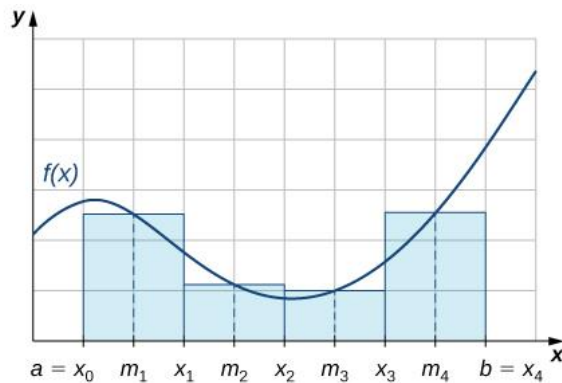Problem 1:

Assume that the mark of 500 milliliters (mL) is L, as illustrated in the figure. You need to estimate the value of L so that the height L volume of the cup is 500 mL

Problem 2:

As we can see in Figure, if $f(x) \geq 0$ over $[a, b]$, $\sum f(m_i)\Delta x$ corresponds to the sum of the areas of rectangles approximating the area between the graph of $f(x)$ and the x-axis over $[a, b]$.

Find the area using trapezoidal and simpson's rule. Find the error and write a discussion based on the relative error.