
Problem 17) The volume of the n^{th} pyramid is given by $V_n = \frac{1}{3}A_nR$, where A_n is its base area and R is its height. Considering that $\sum_{n=1}^N A_n = S = 4\pi R^2$, the volume of the sphere is given by

$$V = \lim_{N \rightarrow \infty} \sum_{n=1}^N (\frac{1}{3}A_nR) = \frac{1}{3}R \sum_{n=1}^N A_n = \frac{1}{3}RS = 4\pi R^3/3.$$
