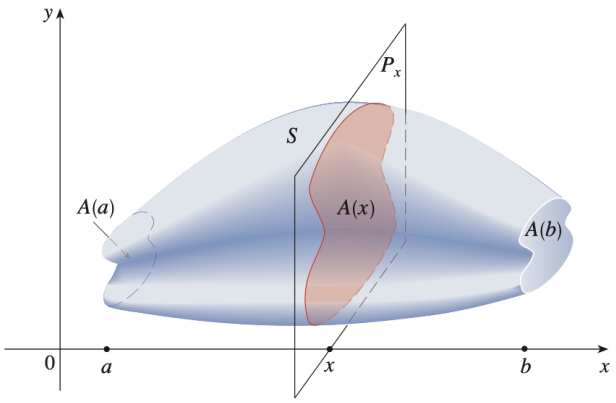
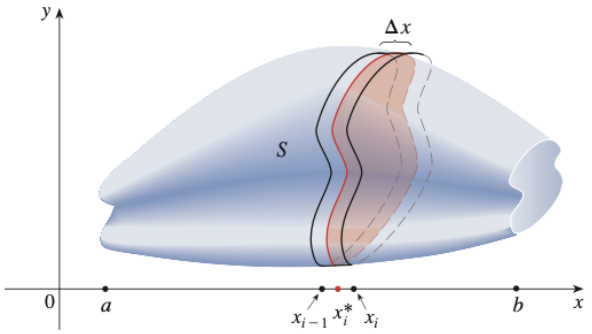
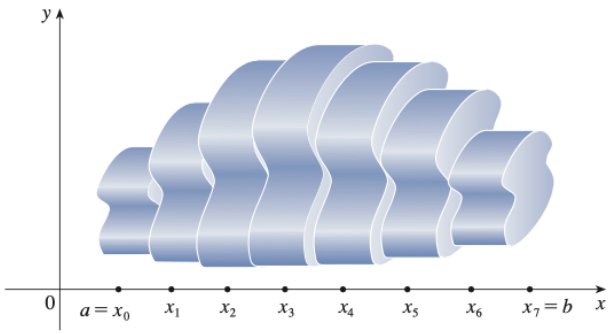
6.2 Volumes by Known Cross-Sections

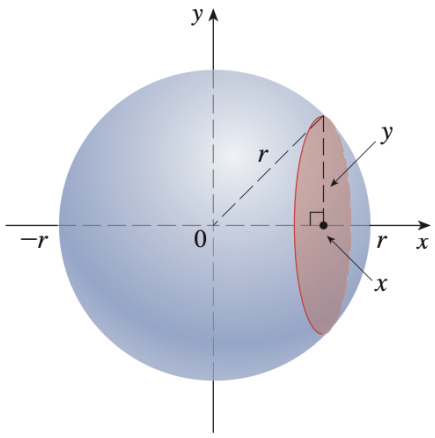
Question. How can we find the volume of a solid region S?

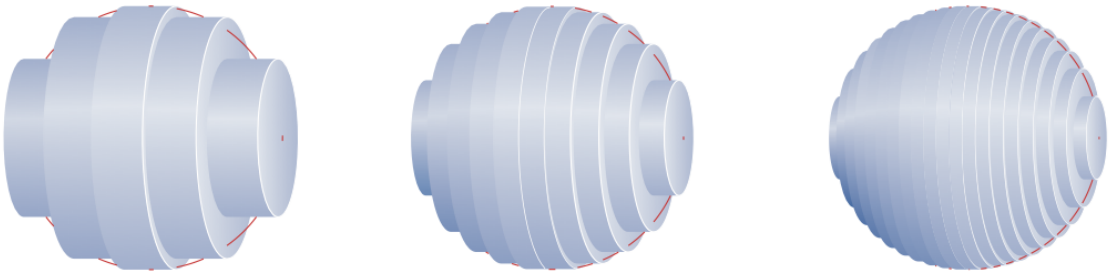






Example. Show that the volume of a sphere of radius r is $V = \frac{4}{3}\pi r^3$.





(a) Using 5 disks, $V \approx 4.2726$ (b) Using 10 disks, $V \approx 4.2097$ (c) Using 20 disks, $V \approx 4.1940$

Approximating the volume of a sphere with radius 1

Example. Let R be the region bounded by $f(x) = x^2$ and $g(x) = x^2 - x - 1$ on the interval $[-1, 2]$. A solid has base R, and cross-sections perpendicular to the x-axis are squares. Find the volume of the solid.