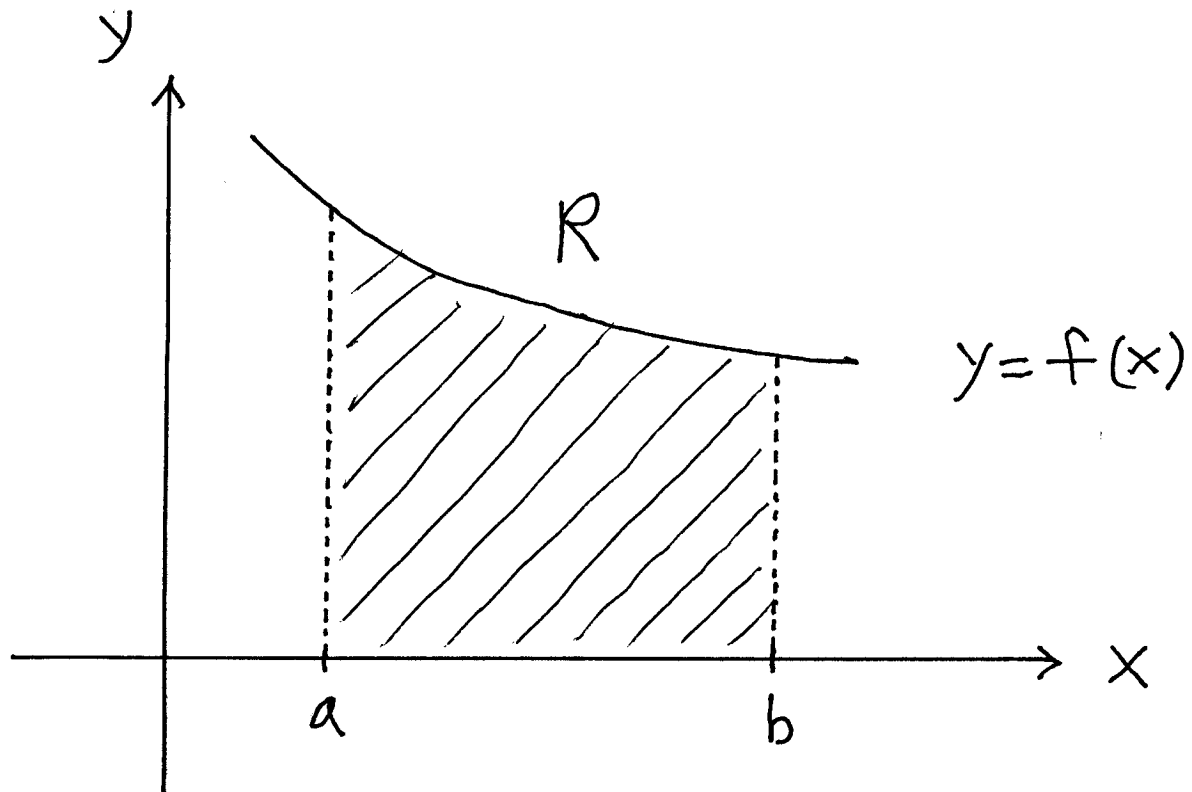
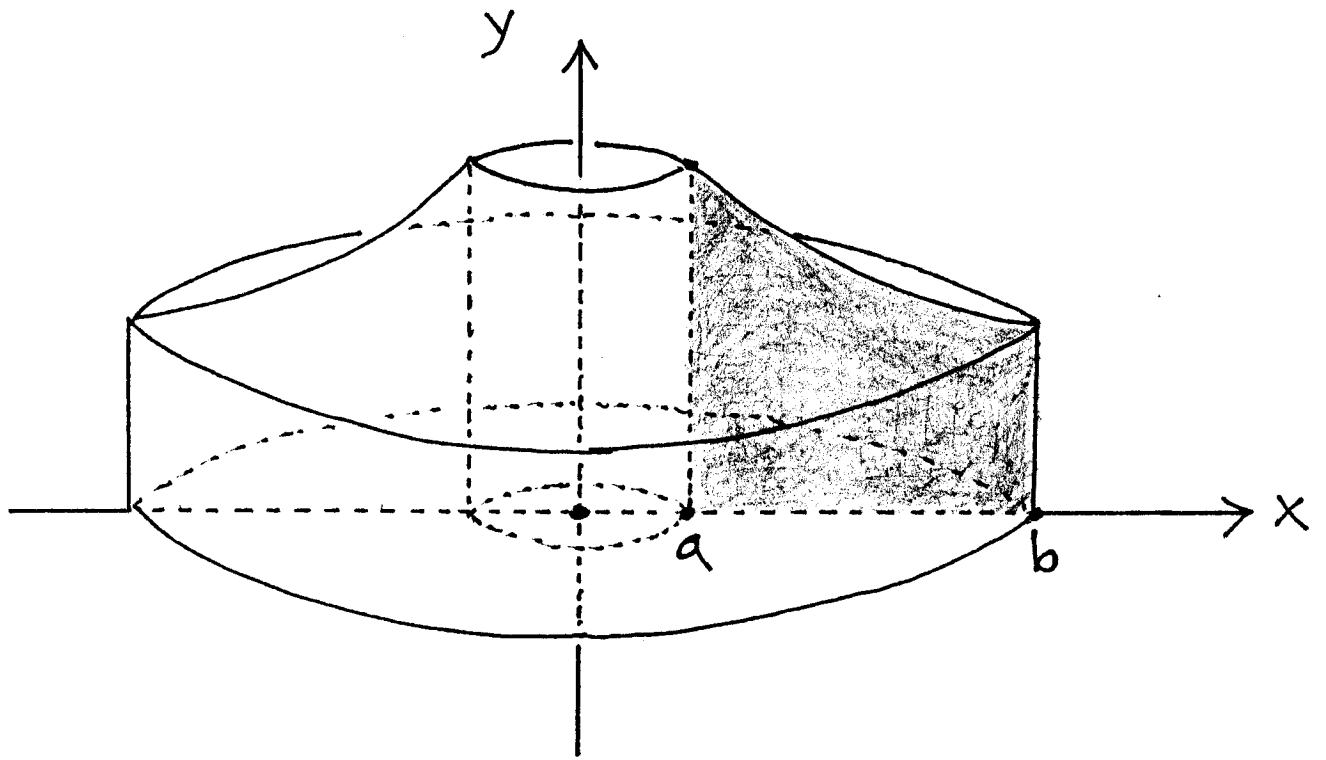


Shell Method - Finding Volume of Solid of Revolution

Consider region R between the x -axis and the graph of $y = f(x)$ on the interval $[a, b]$.

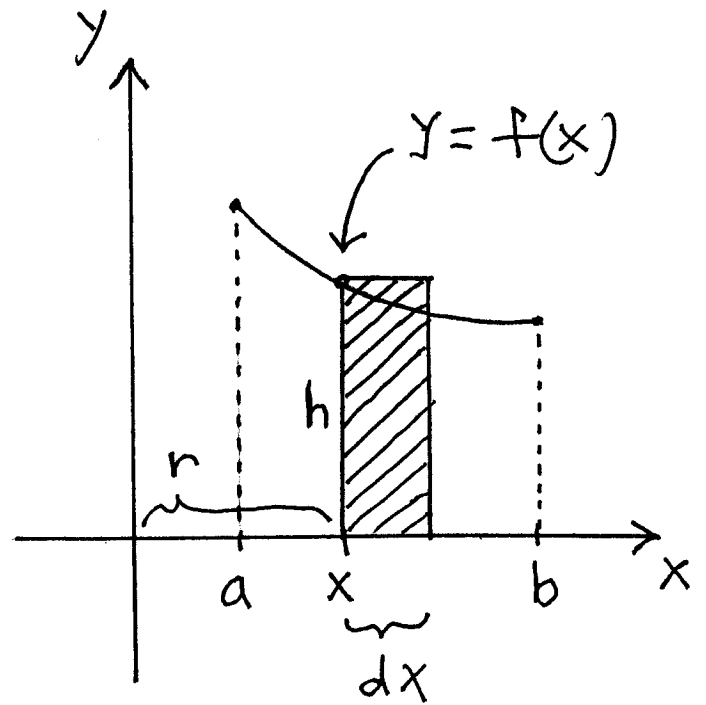


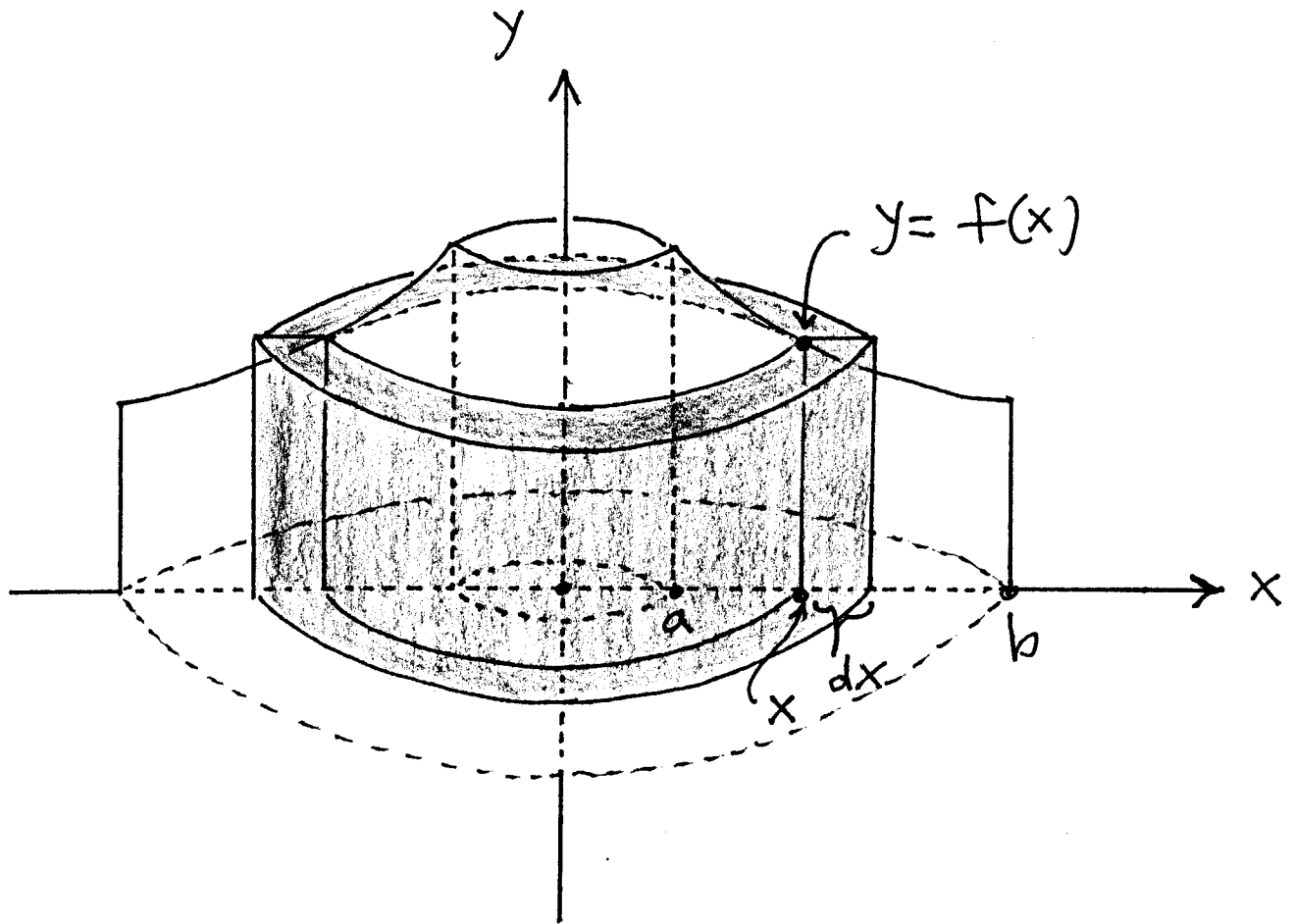
Create a solid of revolution by revolving region R about the y -axis.



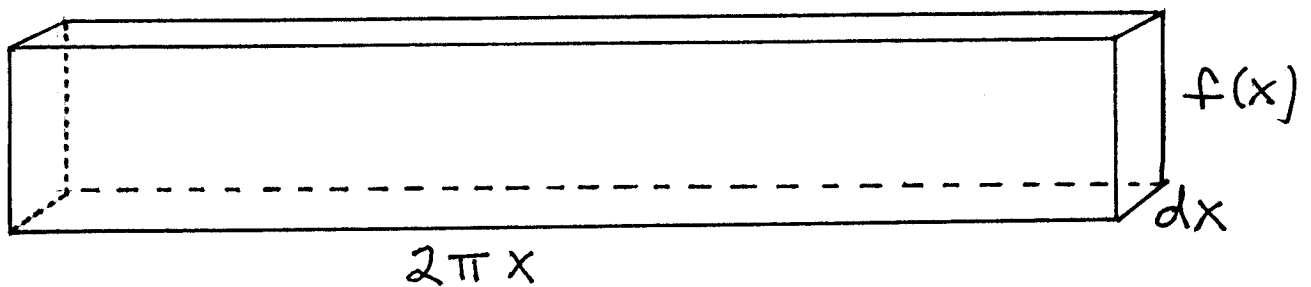
Now form a cylindrical shell at x of height $h = f(x)$, thickness dx , and circumference

$$2\pi r = 2\pi x$$





The volume of the cylindrical shell is approximately $(2\pi x) \cdot (f(x)) \cdot dx$,



and the total volume of the solid is

$$\text{Volume} = 2\pi \int_a^b x \cdot f(x) dx$$

radius
height
 r
 h