Rotated Volume

Consider an arbitrary given function

$$y = f(x)$$

and we are about to rotate the function about x-axis. After the rotation, the under-curve area becomes solid 3 dimensional body's volume. The volume can be computed by bring the idea when we derive the definition of under-curve area, that is, integration.

Let's take a close look of the 3D body. Consider an arbitrary slice of the 3D body, as you can observe, the slice is a disc, whose V volume is characterized by the formula

$$V = \pi r^2 h,$$

where r is the radius of circle in the cross section, h is the height of the slice.