Derivation Of Volume Of A Paraboloid

Volume Of A Paraboloid
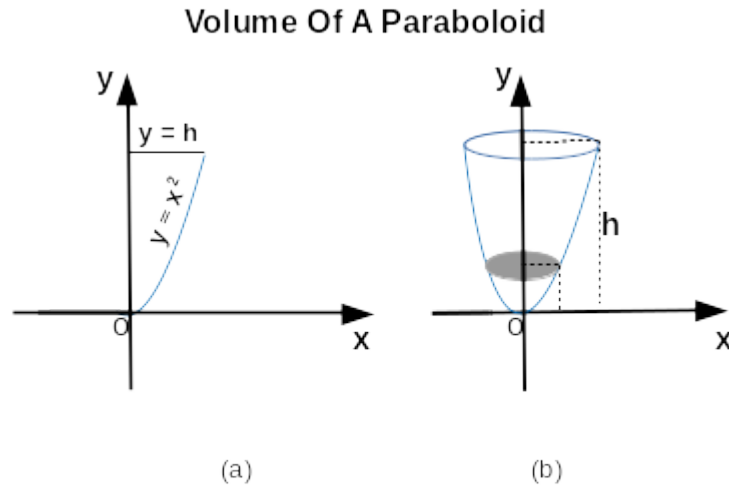

(a)   (b)

Figure 114.5

When the region enclosed by the curve $y = x^2$, $y = h$ and $x = 0$ (figure 114.5a) is revolved about the y axis, the solid obtained is the paraboloid in 114.5b.

Derivation Of Volume Of Paraboloid

Area of cross-section $= \pi x^2 = \pi(\sqrt{y})^2 = \pi y$
Volume of cross-sectional area $= \pi y\, dy$

So, volume of paraboloid $= \displaystyle\int_0^h \pi y \, dy$-------------(1)

$$= \pi \ (h^2)/2.$$

The string is $S_1P_1A_{14}$ ⁃ Empty Space – Containership - Volume