

$$\begin{aligned}
4. \quad V &= 2(2\pi) \int_{\sqrt{r^2 - (h^2/4)}}^r x \sqrt{r^2 - x^2} \, dx \\
&= -2\pi \left[\frac{2}{3} (r^2 - x^2)^{3/2} \right]_{\sqrt{r^2 - (h^2/4)}}^r \\
&= \frac{-4\pi}{3} \left[-\frac{h^3}{8} \right] = \frac{\pi h^3}{6} \text{ which does not depend on } r
\end{aligned}$$

