$$\left(r\cos\varphi - \frac{R}{2}\right)^2 + \left(r\sin\varphi\right)^2 = \left(\frac{R}{2}\right)^2$$

poczêne r:

$$r^2\cos^2\varphi - rR\cos\varphi + \frac{R^2}{4} + r^2\sin^2\varphi = \frac{R^2}{4}$$

+

$$r^2 - rR\cos\varphi = 0$$

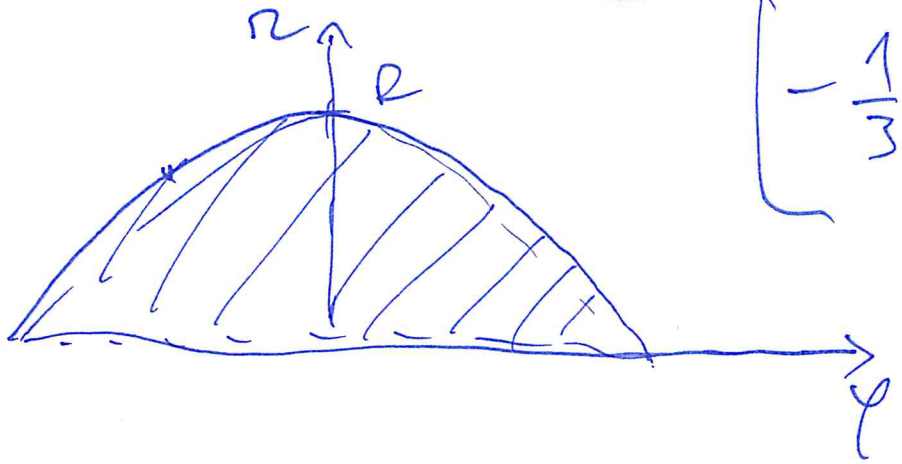
$$r_1 = 0$$

$$r_2 = R\cos\varphi$$

$$\varphi \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$

$$r \in [0, R\cos\varphi]$$

$$V = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left( \int_0^{R\cos\varphi} \sqrt{R^2 - r^2}\; r\, dr \right) d\varphi$$




$$\left[ -\frac{1}{3}\left(R^2 - r^2\right)^{3/2} \right]_0^{R\cos\varphi} = \frac{1}{3}\left(R^3 - R^3|\sin^3\varphi|\right) \cdot 4$$

$$R^2 - R^2\cos^3\varphi = R^3\sin^2\varphi \qquad \sqrt{\sin^6\varphi}$$

$$4\,\frac{R^3}{3}\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 1 - |\sin^3\varphi|\, d\varphi$$