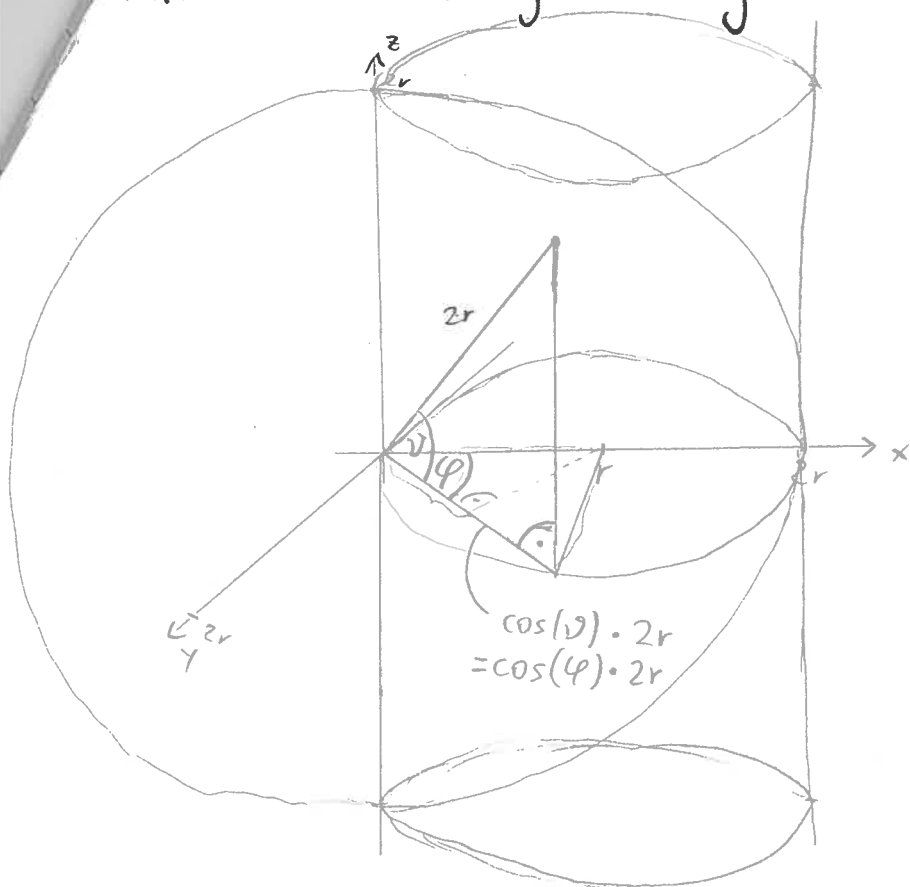


Parametrisierung in Kugelkoordinaten



$$0 \leq \nu \leq \frac{\pi}{2}$$

$$-\cos(\nu) \leq \cos(\varphi) \leq \cos(\nu)$$

$$\begin{aligned} \text{Fläche} &= \int_0^{\pi/2} \int_{-\nu}^{\nu} (2r)^2 \cos \nu \, d\varphi \, d\nu \\ &= \int_0^{\pi/2} 4r^2 \cdot 2\nu \cdot \cos(\nu) \, d\nu \\ &= 8r^2 \left(\nu \cdot \sin(\nu) \Big|_0^{\pi/2} - \int_0^{\pi/2} \sin(\nu) \, d\nu \right) \\ &= 8r^2 \left(\frac{\pi}{2} - [-\cos(\nu)]_0^{\pi/2} \right) \\ &= \underline{\underline{4r^2(\pi - 2)}} \end{aligned}$$