

$$\sqrt{2} = \int_{x=-1}^{x=+1} \left[\int_{y=-\sqrt{1-x^2}}^{y=+\sqrt{1-x^2}} (-2y^2+2) dy \right] dx = \int_{x=-1}^{x=+1} \left[-\frac{2y^3}{3} + 2y \right]_{y=-\sqrt{1-x^2}}^{y=+\sqrt{1-x^2}} dx =$$

$$\begin{aligned} \text{OB: } & \frac{-2(1-x^2)^{3/2}}{3} + 2\sqrt{1-x^2} - \left(\frac{-2(1-x^2)^{3/2}}{3} - 2\sqrt{1-x^2} \right) \\ & \frac{-4(1-x^2)^{3/2}}{3} + 4\sqrt{1-x^2} \end{aligned}$$

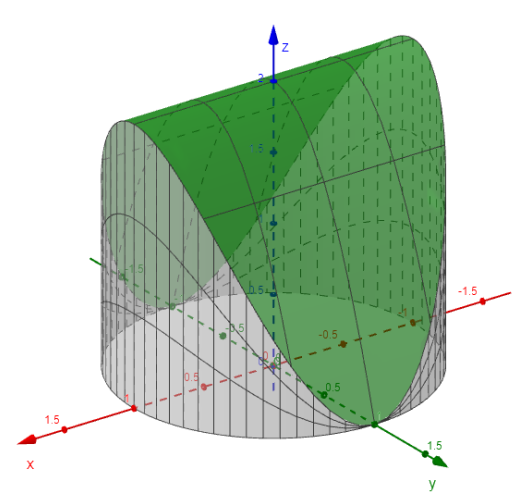
$$\int_{x=-1}^{x=+1} \left(-\frac{4}{3}(1-x^2)^{3/2} + 4\sqrt{1-x^2} \right) dx =$$

$$= -\frac{4}{3} \int_{x=-1}^{x=+1} (1-x^2)^{3/2} dx + 4 \int_{x=-1}^{x=+1} \sqrt{1-x^2} dx =$$

$$\left. 4 \cdot \left[\frac{1}{2} x \sqrt{1-x^2} + \arcsin(x) \right] \right|_{x=-1}^{x=+1} = 2 \left(\left[\frac{1 \cdot 0 + \arcsin(1)}{\frac{\pi}{2}} \right] - \left[\frac{(-1) \cdot 0 + \arcsin(-1)}{-\frac{\pi}{2}} \right] \right) = 2 \cdot \left(\frac{\pi}{2} + \frac{\pi}{2} \right) = 2\pi$$

$$\begin{aligned} -\frac{4}{3} \left[\frac{1}{2} \sqrt{1-x^2} \cdot x \cdot (5-2x^2) + 3 \arcsin(x) \right] \Big|_{x=-1}^{x=+1} &= -\frac{1}{6} \left(\left[\frac{0 \cdot 1 \cdot (5-2)}{\frac{\pi}{2}} + 3 \arcsin(1) \right] - \left[\frac{0 \cdot (-1) \cdot (5-2)}{-\frac{\pi}{2}} + 3 \arcsin(-1) \right] \right) \\ &= -\frac{1}{6} \left(\frac{3\pi}{2} + \frac{3\pi}{2} \right) = -\frac{1}{6} \cdot \frac{6\pi}{2} = -\frac{\pi}{2} \end{aligned}$$

$$2\pi - \frac{\pi}{2} = \frac{3\pi}{2} = \sqrt{\frac{3\pi}{2}}$$



$$V_{\text{Körper}} = \int_{x=-1}^{x=+1} 2x^2 \left[\int_{y=-\sqrt{1-x^2}}^{y=+\sqrt{1-x^2}} dy \right] \cdot dx = \int_{x=-1}^{x=+1} 2x^2 \left[y \Big|_{y=-\sqrt{1-x^2}}^{y=+\sqrt{1-x^2}} \right] dx =$$

ob: $\sqrt{1-x^2}$ un: $(-\sqrt{1-x^2})$
 $\sqrt{1-x^2} - (-\sqrt{1-x^2}) = 2 \cdot \sqrt{1-x^2}$

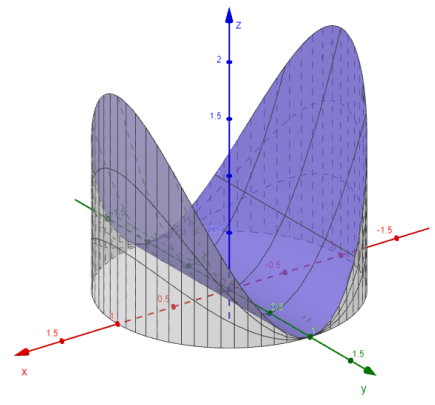
$$\rightarrow = \int_{x=-1}^{x=+1} 4x^2 \sqrt{1-x^2} dx =$$

$$\rightarrow = \left. \frac{\arcsin(x)}{2} + x^3 \sqrt{1-x^2} - \frac{x \sqrt{1-x^2}}{2} \right|_{x=-1}^{x=+1} =$$

$$\rightarrow = \left(\frac{\arcsin(1)}{2} + 1 \cdot \phi - \frac{1 \cdot \phi}{2} \right) - \left(\frac{\arcsin(-1)}{2} + (-1)^3 \phi - \frac{(-1) \cdot \phi}{2} \right) =$$

$\frac{\pi/2}{2}$ ϕ $\frac{\phi}{2}$ $-\frac{\pi/2}{2}$ ϕ $\frac{\phi}{2}$

$$= \frac{\pi}{4} + \frac{\pi}{4} = \frac{\pi}{2} = V_{\text{Körper}}$$



$$V_{\text{Körper}} = V_{\text{Körper 2}} - V_{\text{Körper 1}} = \frac{3\pi}{2} - \frac{\pi}{2} = \frac{2\pi}{2} = \pi$$

