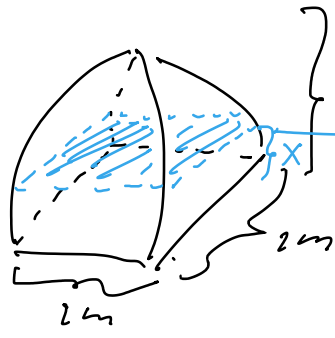
14.03

torsdag 22 december 2022 19:34

a)



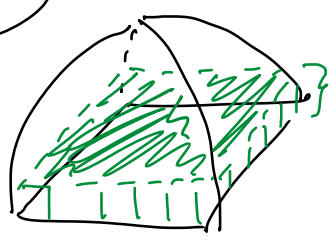
horisontellt plan på höjden x
(sida $\sqrt{4-x^2}$)

höjden som det horisontella planet varierar på är från 0 — 2 m, alltså $0 \le x \le 2$.

$$\int_0^2 dv = \int_0^2 A(x)\,dx = \int_0^2 \left(\sqrt{4-x^2}\right)^2 dx = \int_0^2 4-x^2\,dx =$$

$$= \left[4x - \frac{x^3}{3}\right]_0^2 = 8 - \frac{8}{3} = \frac{24-8}{3} = \underline{\underline{\frac{16}{3}\ m^3}}$$

b)



$$\int_0^1 4 - x^2\,dx = \left[4x - \frac{x^3}{3}\right]_0^1 = 4 - \frac{1}{3} = \underline{\underline{\frac{11}{3}\ m^3}}$$