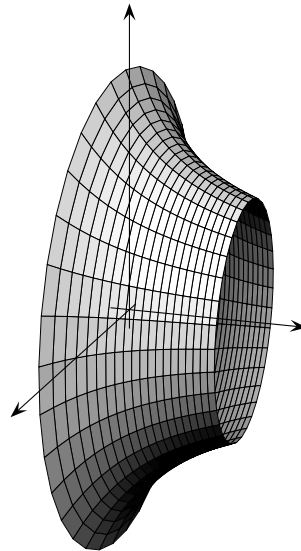
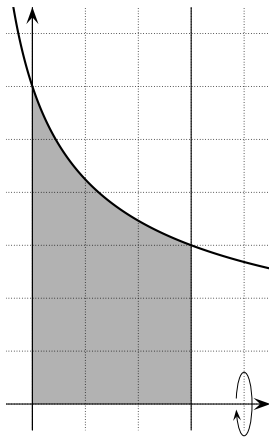


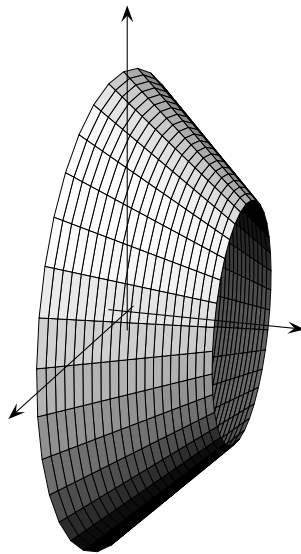
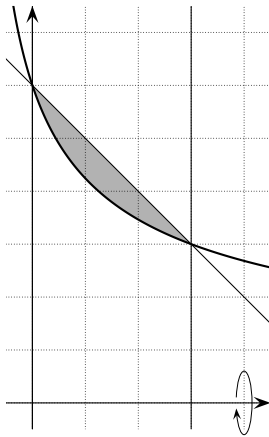
Chamblandes 2005 — Exercice 3

a)

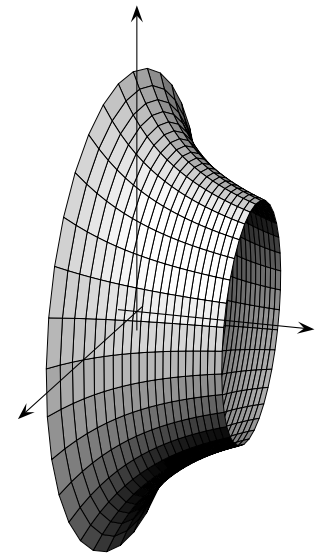


$$\begin{aligned} \pi \int_0^3 \left(\frac{6}{\sqrt{x+1}} \right)^2 dx &= \pi \int_0^3 \frac{36}{x+1} dx = 36 \pi \int_0^3 \frac{1}{x+1} dx = 36 \pi \left[\ln(|x+1|) \right]_0^3 = \\ 36 \pi \left(\ln(|3+1|) - \ln(|0+1|) \right) &= 36 \pi \left(\underbrace{\ln(4)}_{2 \ln(2)} - \underbrace{\ln(1)}_0 \right) = 72 \pi \ln(2) \approx 156,79 \end{aligned}$$

b)



—



$$\begin{aligned} \pi \int_0^3 (-x+6)^2 dx &= \pi \int_0^3 (x^2 - 12x + 36) dx = \pi \left[\frac{1}{3} x^3 - 6x^2 + 36x \right]_0^3 = \\ \pi \left(\left(\frac{1}{3} \cdot 3^3 - 6 \cdot 3^2 + 36 \cdot 3 \right) - \left(\frac{1}{3} \cdot 0^3 - 6 \cdot 0^2 + 36 \cdot 0 \right) \right) &= \pi (63 - 0) = 63 \pi \end{aligned}$$

On conclut que le volume recherché vaut :

$$63 \pi - 72 \pi \ln(2) = 9 \pi (7 - 8 \ln(2)) \approx 41,13$$