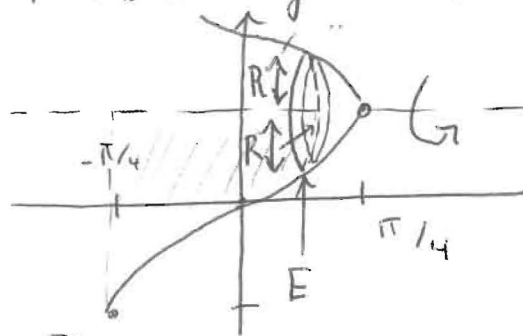


Corrigé Devoir 4

Calculer le volume du solide de révolution en genré par la rotation de la courbe $y = \tan x$ au tour de l'axe $y = 1$, de $-\frac{\pi}{4}$ à $\frac{\pi}{4}$.



$$y = 1 \quad E = dx$$

$$R = 1 - y = 1 - \tan x$$

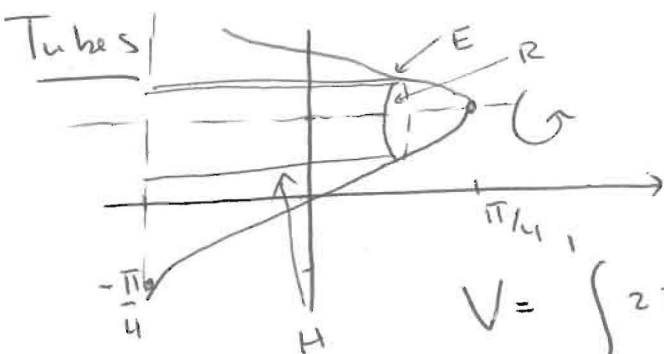
Disques

$$V = \int_{-\pi/4}^{\pi/4} \pi (1 - \tan x)^2 dx = \int_{-\pi/4}^{\pi/4} \pi (1 - 2 \tan x + \tan^2 x) dx$$

$$= \pi \int_{-\pi/4}^{\pi/4} \sec^2 x dx - 2\pi \int_{-\pi/4}^{\pi/4} \tan x dx$$

$$= \pi \left(\tan x \right)_{-\pi/4}^{\pi/4} + 2\pi \left(\ln |\cos x| \right)_{-\pi/4}^{\pi/4}$$

$$= \pi (1 - -1) = 2\pi u^3$$



$$E = dy$$

$$R = 1 - y$$

$$H = x - -\frac{\pi}{4} = \arctan y + \frac{\pi}{4}$$

$$V = \int_{-1}^1 2\pi (1 - y) \left(\arctan y + \frac{\pi}{4} \right) dy = 2\pi u^3$$

Plus compliqué !

avec du TRAVAIL !