

2)

$$a) f(x) = 2 \cos\left(\frac{1}{5}x\right)$$

on sait que $\cos^2 \beta = \frac{\cos(2\beta) + 1}{2}$

$$f^2(x) = 2 \left(\frac{\cos\left(2 \times \frac{1}{5}x\right) + 1}{2} \right)$$

$$= 2 \left(\frac{\cos\left(\frac{2}{5}x\right) + 1}{2} \right)$$

$$= 2 \frac{\cos\left(\frac{2}{5}x\right) + 1}{2}$$

on simplifie par 2.

$$f(x)^2 = 2 \cos \frac{2x}{5} + 2$$

Determiner de $I = \int_0^{\pi} [f(x)^2] dx$

$$= \int_0^{\pi} 2 \cos\left(\frac{2x}{5}\right) + 2 dx$$

$$= \left[2 \sin\left(\frac{2x}{5}\right) \times \frac{5}{2} + 2x \right]_0^{\pi}$$

$$= \left[5 \sin\left(\frac{2x}{5}\right) + 2x \right]_0^{\pi}$$

$$= 5 \sin\left(\frac{2\pi}{5}\right) + 2\pi - 5 \sin(0) - 0$$

$$= 5 \sin\left(\frac{2\pi}{5}\right) + 2\pi$$

$$F(x) = 2 \sin\left(\frac{2x}{5}\right) \times \frac{5}{2} + 2x$$

$$b) V = 2I = 2 \left(5 \sin\left(\frac{2\pi}{5}\right) + 2\pi \right) = 10 \sin\left(\frac{2\pi}{5}\right) + 4\pi$$

$$c) 10 \sin\left(\frac{2\pi}{5}\right) + 4\pi \approx 23 \text{ cm}^3.$$