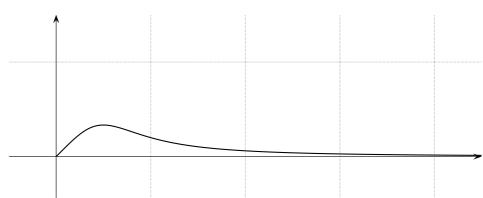
11.22





$$2) \ \pi \int_0^{+\infty} \left(\frac{x}{4x^3+1}\right)^2 dx = \pi \int_0^{+\infty} \frac{x^2}{(4x^3+1)^2} dx = \pi \lim_{t \to +\infty} \int_0^t \frac{x^2}{(4x^3+1)^2} dx$$

$$= \pi \lim_{t \to +\infty} \frac{1}{12} \int_0^t (4x^3+1)^{-2} \cdot 12x^2 dx = \frac{\pi}{12} \lim_{t \to +\infty} \frac{1}{-1} (4x^3+1)^{-1} \Big|_0^t =$$

$$\frac{\pi}{12} \lim_{t \to +\infty} -\frac{1}{4x^3+1} \Big|_0^t = \frac{\pi}{12} \lim_{t \to +\infty} \left(-\frac{1}{4t^3+1} + \frac{1}{4 \cdot 0^3+1}\right) =$$

$$\frac{\pi}{12} \lim_{t \to +\infty} \left(-\frac{1}{4t^3+1} + 1\right) = \frac{\pi}{12} \lim_{t \to +\infty} \left(-\frac{1}{4t^3} + 1\right) = \frac{\pi}{12} (-0+1) = \frac{\pi}{12}$$

Analyse : intégrales Corrigé 11.22