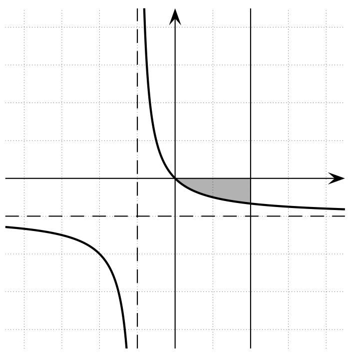
Chamblandes 2011 — Problème 3

(A)

		-1		0	
$-x$	$+$		$+$	0	$-$
$x+1$	$-$	0	$+$		$+$
f	$-$	0	$+$	0	$-$



$\lim\limits_{x \to -1} \dfrac{-x}{x+1} = \dfrac{1}{0} = \infty$: $x = -1$ asymptote verticale

$$\begin{array}{r|l} -x & x+1 \\ \cline{2-2} x+1 & -1 \\ \hline 1 & \end{array}$$

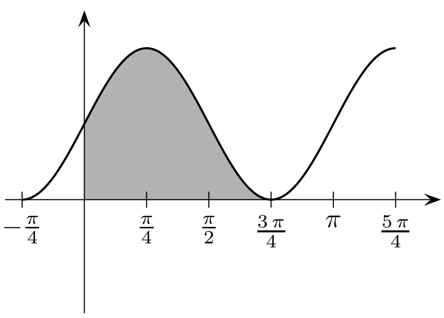
$y = -1$ asymptote horizontale

Calculons l'aire recherchée :

$$-\int_0^2 -\frac{x}{x+1}\,dx = -\int_0^2 -1 + \frac{1}{x+1}\,dx = \int_0^2 1 - \frac{1}{x+1}\,dx = x - \ln\big(|x+1|\big)\Big|_0^2 =$$

$$\Big(2 - \ln\big(|2+1|\big)\Big) - \Big(0 - \ln\big(|0+1|\big)\Big) = 2 - \ln(3) - \underbrace{\ln(1)}_{0} = 2 - \ln(3)$$

(B)



L'aire recherchée vaut :

$$\int_0^{\frac{3\pi}{4}} 1 + \sin(2\,x)\,dx = x - \tfrac{1}{2}\,\cos(2\,x)\Big|_0^{\frac{3\pi}{4}} = \big(\tfrac{3\pi}{4} - \tfrac{1}{2}\,\underbrace{\cos(\frac{3\,\pi}{2})}_{0}\big) - \big(0 - \tfrac{1}{2}\,\underbrace{\cos(0)}_{1}\big) = \tfrac{3\pi}{4} + \tfrac{1}{2}$$