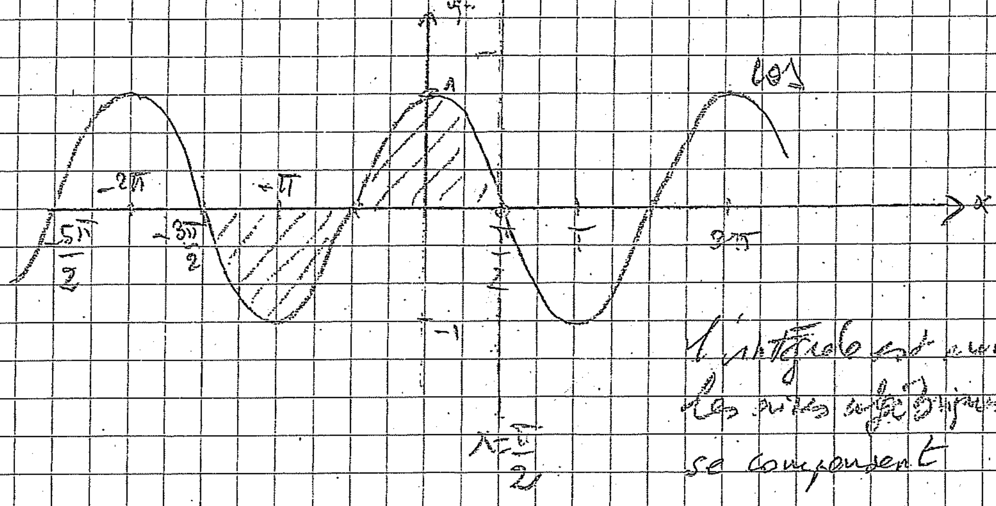
ex 12



l'intégrale est nulle donc les aires algébriques > 0 et < 0 se compensent

$a = -\frac{3\pi}{2}$, ou $a = -\frac{7\pi}{2}$ ou ...

ex 13

cf cours

a) $I = A = 8$

b) $I = 0$

c) $I = \int_2^4 g(x)dx = \left(\frac{4+2}{2}\right) \cdot 2 = 6$ (aire d'un trapèze)

d) $I = A = 16$

e) $I = -A = -20$

f) $A = 0$

g) $I = A = 8$

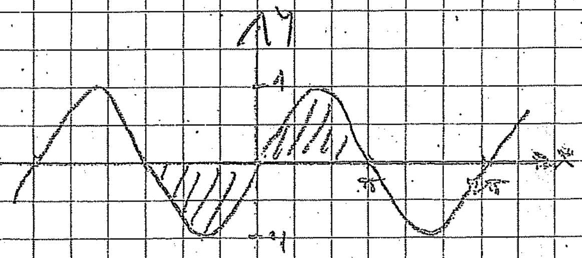
h) $I = A = 4$

i) $I = A = 2\pi$

j) $I = -A = -4\pi$

k) $I = A = \pi + 10$

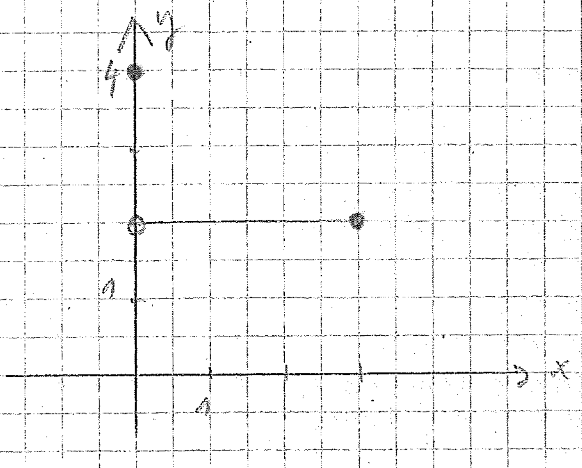
l)



$I = 0$

ex 14 $f(x) = \begin{cases} 2 & \text{si } x \in]0;3] \\ 4 & \text{si } x = 0 \end{cases}$

(a)



(b) $\Delta = \frac{3-0}{n} = \frac{3}{n}$

$x_0 = 0$; $x_1 = \frac{3}{n}$; $x_2 = 2 \cdot \frac{3}{n}$; $x_3 = 3 \cdot \frac{3}{n}$; ... ; $x_{n-1} = (n-1) \cdot \frac{3}{n}$; $x_n = n \cdot \frac{3}{n} = 3$

(c) $S_n = \frac{3}{n} \cdot 4 + \underbrace{\frac{3}{n} \cdot 2 + \frac{3}{n} \cdot 2 + \dots + \frac{3}{n} \cdot 2}_{(n-1) \text{ fois}} = \frac{12}{n} + (n-1) \cdot \frac{3}{n} \cdot 2 = \frac{12}{n} + \frac{6(n-1)}{n}$

$s_n = \underbrace{\frac{3}{n} \cdot 2 + \frac{3}{n} \cdot 2 + \dots + \frac{3}{n} \cdot 2}_{n \text{ fois}} = n \cdot \frac{3}{n} \cdot 2 = 6$

$\lim_{n \to \infty} S_n = \lim_{n \to \infty} \frac{12}{n} + \frac{6(n-1)}{n} = \lim_{n \to \infty} \frac{12}{n} + \lim_{n \to \infty} \frac{n(6 - \frac{6}{n})}{n} = 0 + 6 = 6$

$\lim_{n \to \infty} s_n = \lim_{n \to \infty} 6 = 6$

donc $\int_0^3 f(x)\,dx = 6$