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5) a) $$\int_k^{\pi/2} \cos x \, dx = \frac{1}{2} \qquad k \ \left(0<k<\frac{\pi}{2}\right)$$

$f = \cos x \, dx$

$F = \int \cos x \, dx = \boxed{\operatorname{sen} x + C}$

$\cancel{C} - \cancel{C} \quad F\left(\frac{\pi}{2}\right) - F(k) = \frac{1}{2}$

$\operatorname{Sen}\left(\frac{\pi}{2}\right) - \operatorname{Sen}(k) = \frac{1}{2}$

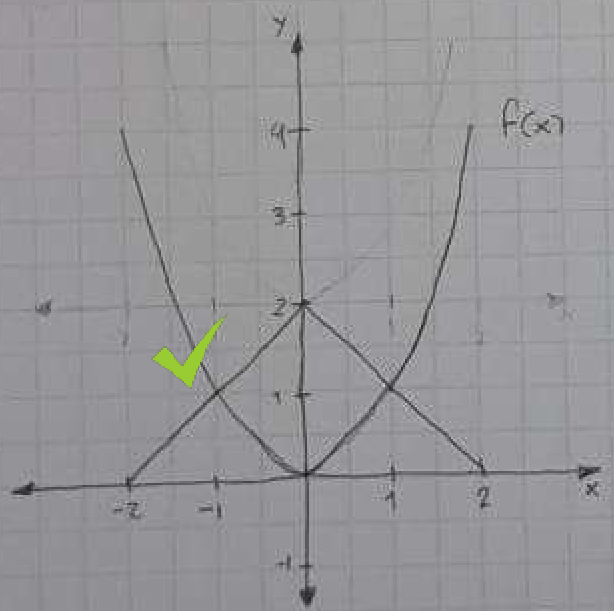
$1 - \operatorname{Sen}(k) = \frac{1}{2}$

$\operatorname{Sen}(k) = \frac{1}{2}$

$k = \frac{\pi}{6}$

Rta: el valor k que cumple es $k = \frac{\pi}{6}$

b)



$f(x) = x^2$

$g(x) = 2 - |x|$

$= \int_{-1}^{1} 2-|x| - \int_{-1}^{1} x^2$

$= 3 - \frac{2}{3}$

$= \boxed{\frac{7}{3}}$

Rta: El area encerrada es de 7/3

$\int_{-1}^{1} 2-|x| = \int_{-1}^{0} 2+x + \int_{0}^{1} 2-x$

$= F(0) - F(-1) + F_2(1) - F_2(0)$

$= 2\cdot 0 + \frac{0^2}{2} - \left[2(-1) + \frac{(-1)^2}{2}\right] + 2\cdot 1 - \frac{1^2}{2} - 0 + C$

$= + \frac{3}{2} + \frac{3}{2} = \frac{6}{2} = \boxed{3}$

$F(x) = 2x + \frac{x^2}{2} + C \qquad F_2(x) = 2x - \frac{x^2}{2} + C$

$\int_{-1}^{1} x^2 = F(1) - F(-1)$

$= \frac{1^3}{3} - \frac{-1^3}{3} + \cancel{C} - \cancel{C}$

$= \frac{2}{3}$

$F(x) = \frac{x^3}{3} + C$

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5) c)

	$x=0$	$x=1$
f	2	4
g	6	-3
f'	-4	3
g'	2	-1

Si $\int_0^1 f'_{(x)} \cdot g_{(x)}\, dx = 5$

$\int_0^1 f_{(x)} \cdot g'_{(x)}$

$u\, dv = u\, v - \int v\, du$

$\underbrace{f_{(x)}}_{u} \cdot \underbrace{g'(x)}_{dv} = u\, v - \int v\, du$

$= f_{(x)} \cdot g_{(x)} - \underbrace{\int g_{(x)} \cdot f'_{(x)}}_{-5}$

$F_{(1)} - F_{(0)}$

$= [f_{(1)} \cdot g_{(1)} - 5] - [f_{(0)} \cdot g_{(0)} - 5]$ ✗

2.1

$= [4 \cdot (-3) - 5] - [2 \cdot 6 - 5]$

$= [-12 - 5] - [12 - 5]$

$= -17 - 7$

$\boxed{= -24}$

$u = f(x)$
$du = f'(x)$
$dv = g'(x)$
$v = g(x)$

$\boxed{\int_0^1 f(x) \cdot g'(x) = -24}$

Índice de comentarios