

Corrección Quiz Cálculo Vectorial:

① $f(x,y) = y^2 - x^2$

$g(x,y) = \frac{1}{4}x^2 + y^2 - 1$

$\frac{\partial}{\partial x} (y^2 - x^2 = \lambda (\frac{1}{4}x^2 + y^2 - 1))$

$-2x = \lambda \frac{1}{2}x$ ①

$-2x - \lambda \frac{1}{2}x = x(-2 - \frac{\lambda}{2}) = 0$

$x=0, \lambda=-4$

$y^2 - 1 = 0 \Rightarrow y = \pm 1$

$\frac{\partial}{\partial y} (y^2 - x^2 = \lambda (\frac{1}{4}x^2 + y^2 - 1))$

$2y = \lambda 2y$ ②

$2y = -8y \Rightarrow y(2+8) = 0$

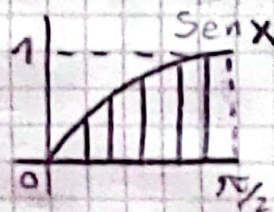
$y=0$

$\frac{1}{4}x^2 + y^2 - 1$ ③

$x = \pm 2$

$f(2,0) = -4$	Minimor
$f(-2,0) = -4$	
$f(0,1) = 1$	Maximor
$f(0,-1) = 1$	

② $\int_0^1 \int_{\arcsen y}^{\pi/2} \cos x \sqrt{1+\cos^2 x} dx dy$



$0 \leq x \leq \pi/2$

$0 \leq y \leq \text{sen } x$

$\int_0^{\pi/2} \int_0^{\text{sen } y} \cos x \sqrt{1+\cos^2 x} dy dx$

$\int_0^{\pi/2} \left[y \cos x \sqrt{1+\cos^2 x} \right]_0^{\text{sen } x} dx$

$\int_0^{\pi/2} \text{sen } x \cos x \sqrt{1+\cos^2 x} dx$

$u = \cos^2 x + 1$

$\frac{du}{dx} = -2 \cos x \text{sen } x$

$dx = -\frac{1}{2 \cos x \text{sen } x} du$

$-\frac{1}{2} \int_0^{\pi/2} \frac{1}{\sqrt{u}} du$

$u^{1/2} \rightarrow \frac{u^{3/2}}{3/2}$

$\frac{2\sqrt{2}+1}{3}$

$-\frac{1}{2} \left(\frac{2u^{3/2}}{3} \right) = -\frac{1}{2} \cdot \frac{2(\cos^2 x + 1)^{3/2}}{3} = -\frac{(\cos^2 x + 1)^{3/2}}{3} \Big|_0^{\pi/2} = \frac{2\sqrt{2}}{3} - \frac{1}{3}$