Evaluación

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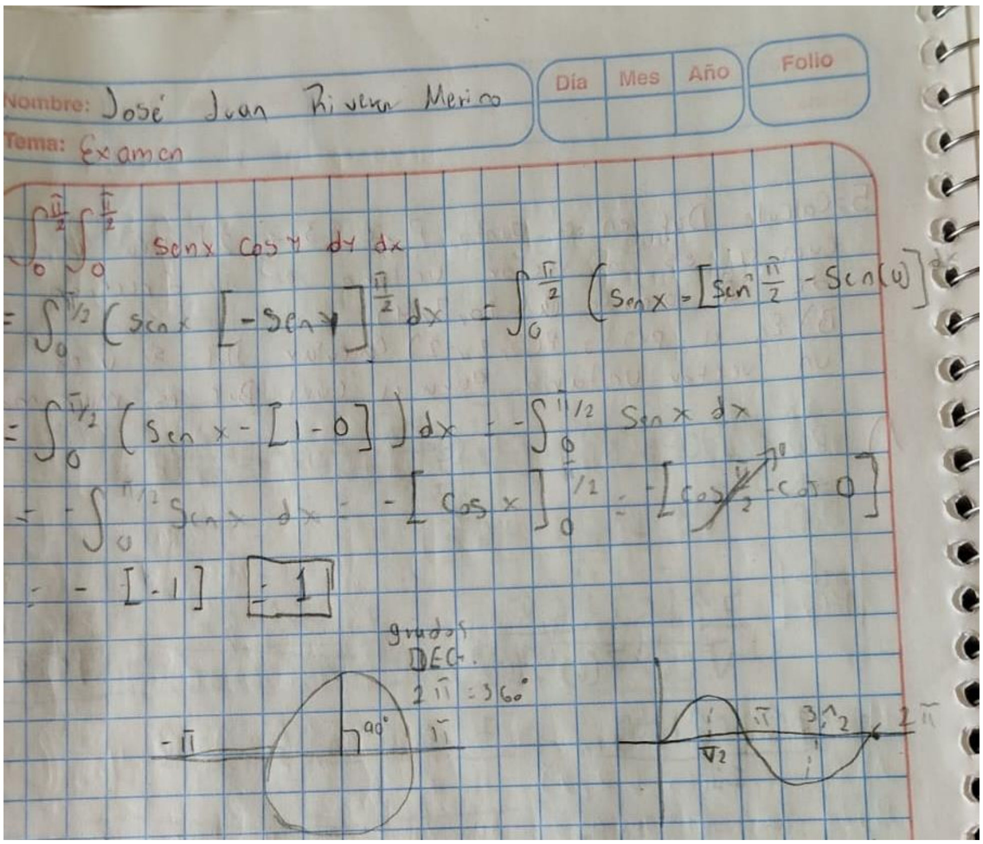
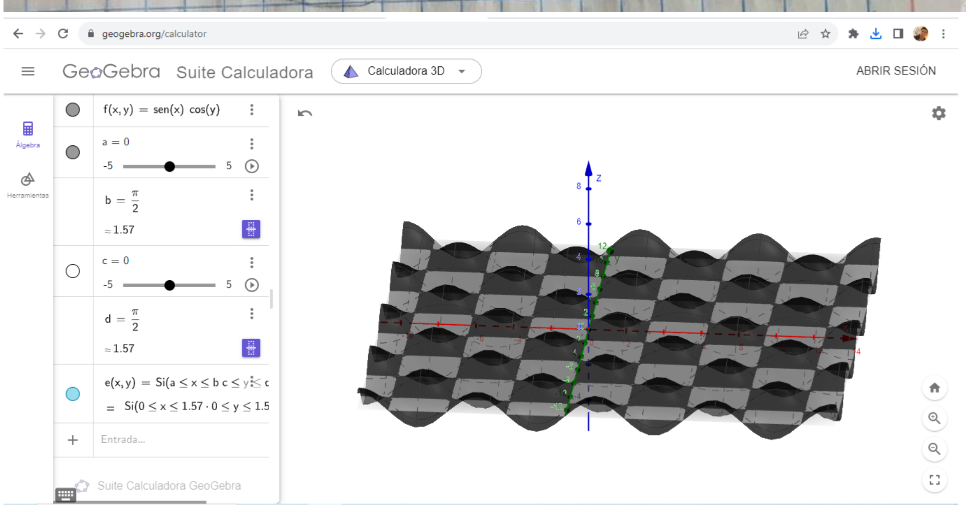
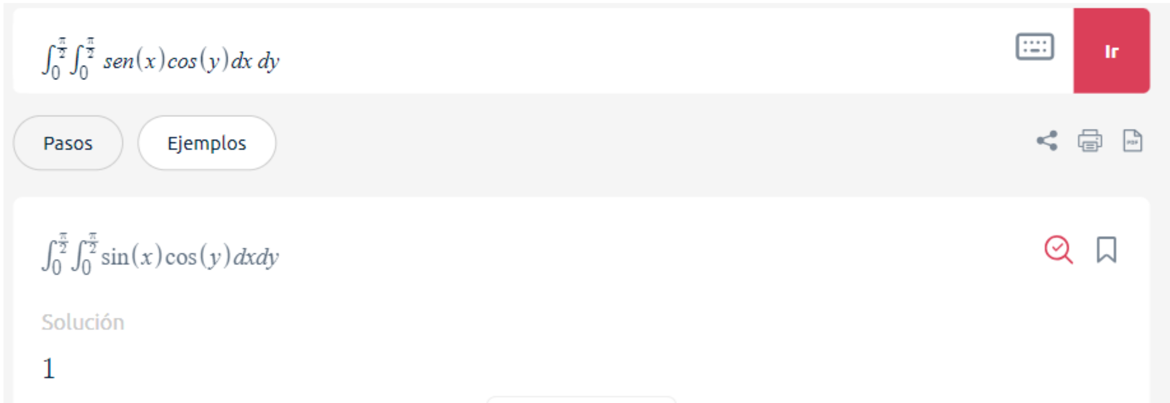
Matemáticas para ingeniería I

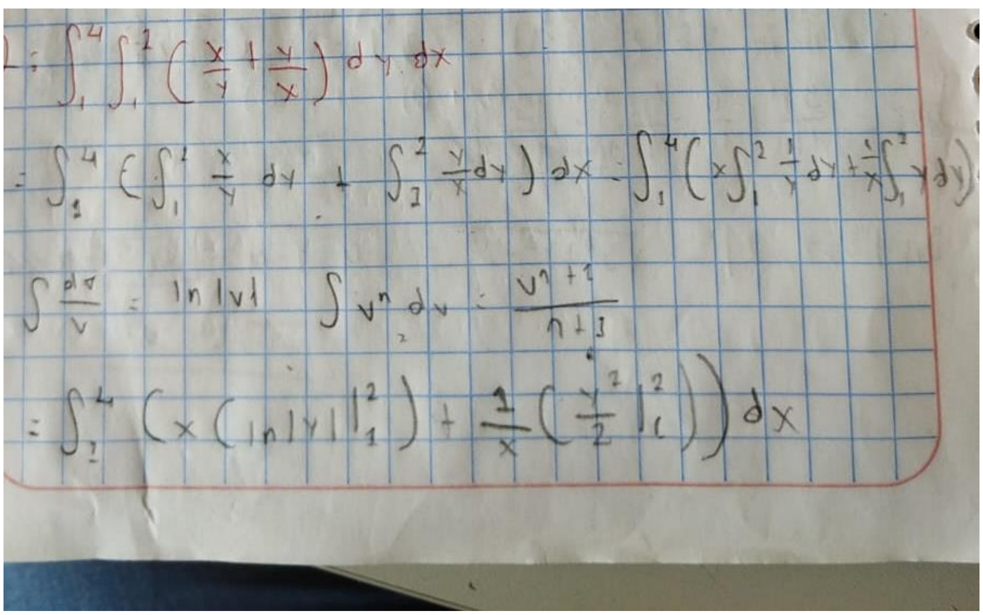
1) $\int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} sen(x)\cos(y)\,dydx$







2) $\int_1^4\int_1^2 \frac{x}{y}+\frac{y}{x}\,dydx$



$$\int_1^4\int_1^2\left(\frac{x}{y}+\frac{y}{x}\right)dy\,dx$$

$$=\int_1^4\left(\int_1^2\frac{x}{y}dy+\int_1^2\frac{y}{x}dy\right)dx=\int_1^4\left(x\int_1^2\frac{1}{y}dy+\frac{1}{x}\int_1^2 y\,dy\right)$$

$$\int\frac{dv}{v}=\ln|v| \qquad \int v^n\,dv=\frac{v^{n+1}}{n+1}$$

$$=\int_1^4\left(x\left(\ln|y|\Big|_1^2\right)+\frac{1}{x}\left(\frac{y^2}{2}\Big|_1^2\right)\right)dx$$

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Tema:

Día	Mes	Año	Folio

$$= \int_1^4 \left(x(\ln|2| - \ln|1|) + \frac{1}{x}\left(\frac{2^2}{2} - \frac{1^2}{2}\right)\right) dx$$

$$= \int_1^4 \left(x(\ln 2) + \frac{1}{x}\left(\frac{3}{2}\right)\right) dx$$

$$= \ln 2 \int_1^4 x\,dx + \frac{3}{2}\int_1^4 \frac{1}{x}\,dx = \ln 2\left(\frac{x^2}{2}\Big|_1^4\right) + \frac{3}{2}\left(\ln|x|\Big|_1^4\right)$$

$$= \ln 2\left(\frac{4^2}{2} - \frac{1^2}{2}\right) + \frac{3}{2}(\ln|4| - \ln|1|)$$

$$= \ln 2\left(\frac{15}{2}\right) + \frac{3}{2}(\ln 4) = \frac{15}{2}\ln 2 + \frac{3}{2}\ln 4$$

$$= \frac{15}{2}\ln 2 + \frac{3}{2}\ln 2^2 \qquad \ln a^n = n\ln a$$

$$= \frac{15}{2}\ln 2 + \frac{3}{2}(2)\ln 2 = \frac{15}{2}\ln 2 + 3\ln 2$$

$$= \left(\frac{15}{2} + 3\right)\ln 2 = \boxed{\frac{21}{2}\ln 2 = 7.278045}$$

$$dM = \int_1^2 \left(\int_1^4 \frac{x}{y}\,dx + \int_1^4 \frac{y}{x}\,dx\right) dy = \int_1^2 \left(y\int_1^4 \frac{1}{x}\,dx + \frac{1}{y}\int_1^4 x\,dx\right)$$

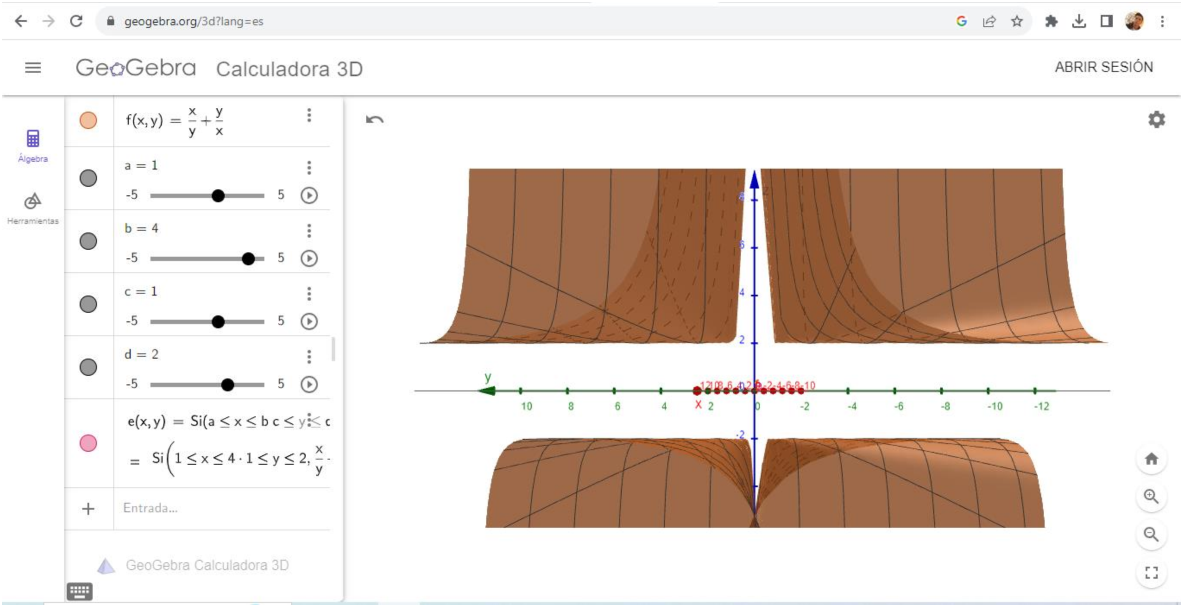
$$= \int_1^2 \left(y\left(\ln|x|\Big|_1^4\right) + \frac{1}{y}\left(\frac{x^2}{4}\Big|_1^4\right)\right) dy$$

$$= \int_1^2 \left(y(\ln|4| - \ln|1|) + \frac{1}{y}\left(\frac{4^2}{4} - \frac{1^2}{4}\right)\right) dy$$

$$= \int_1^2 \left(y(\ln 4) + \frac{1}{y}\left(\frac{15}{4}\right)\right) dx = \ln 4\int_1^2 y\,dy + \frac{15}{4}\int_1^2 \frac{1}{y}\,dy$$

$$= \ln 4\left(\frac{y^2}{4}\Big|_1^2\right) + \frac{15}{4}\left(\ln|y|\Big|_1^2\right) = \ln 4\left(\frac{3}{4}\right) + \frac{15}{4}(\ln 2) = \frac{15}{4}\ln 4 + \frac{3}{4}(4)\ln$$

$$= 15/4\ln 4 + 3\ln 4 = \boxed{\frac{21}{4}\ln 4 = 7.278049}$$



3) $\int_0^{ln2} \int_0^{ln5} e^{2x-y}\, dxdy$

3.- $\int_0^{\ln 2}\int_0^{\ln 5} e^{2x-y}\,dx\,dy$ José Juan Rivera Merino

$$= \int_0^{\ln 2}\left[\int_0^{\ln 5} e^{2x-y}\,dx\right] dy$$

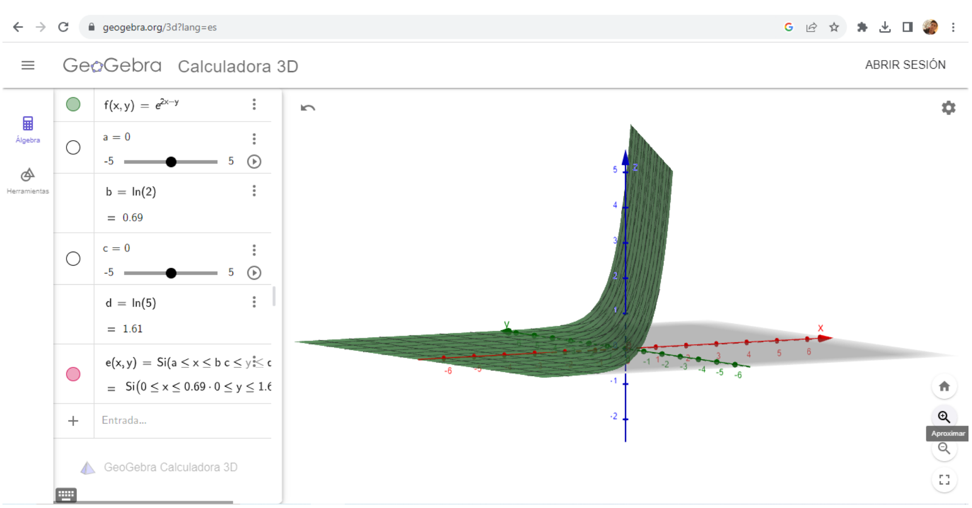
$$= \int e^{2x-y}\,dx = \frac{1}{2} e^{2x-y} = \frac{1}{2} e^{2\ln|5|-y} - \frac{1}{2} e^{-y}$$

$$= \frac{1}{2} e^{\ln 25-y} - \frac{1}{2} e^{-y} = \frac{1}{2}\cdot 25 e^{-y} - \frac{1}{2} e^{-y}$$

$$= \frac{25}{2} e^{-y} - \frac{1}{2} e^{-y} = \frac{24}{2} e^{-y} = 12 e^{-y}$$

$$= \int_0^{\ln 2} 12 e^{-y}\,dy = -12 e^{-\ln 2} + 12 = -12\cdot\frac{1}{2} + 12$$

$$= -\frac{12}{2} + 12 = -6 + 12 = \boxed{6}$$



$\int_0^{ln2}\int_0^{ln5} e^{2x-y}\,dx\,dy$

Ir

Pasos Ejemplos

$\int_0^{\ln(2)}\int_0^{\ln(5)} e^{2x-y}dxdy$

Solución

6

Ocultar pasos