

Evaluación

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Matemáticas para ingeniería I

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

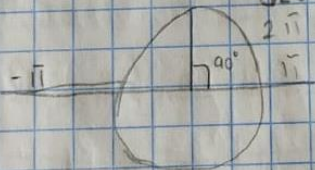
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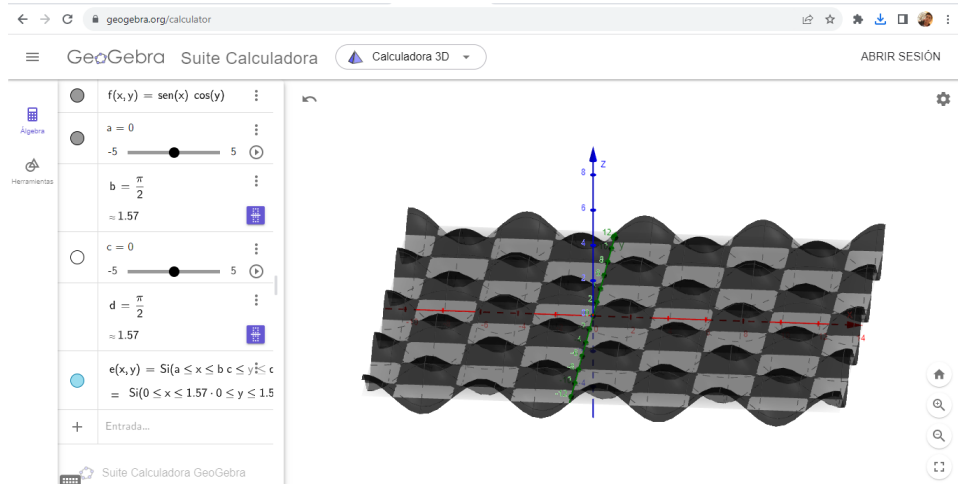
Tema: Examen

Día Mes Año Folio

$$\begin{aligned} & \int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \operatorname{sen} x \cos y \, dy \, dx \\ &= \int_0^{\frac{\pi}{2}} \left(\operatorname{sen} x \left[-\operatorname{sen} y \right]_0^{\frac{\pi}{2}} \right) dx = \int_0^{\frac{\pi}{2}} \left(\operatorname{sen} x \left[-\operatorname{sen} \frac{\pi}{2} - (-\operatorname{sen} 0) \right] \right) dx \\ &= \int_0^{\frac{\pi}{2}} \left(\operatorname{sen} x \left[-1 - 0 \right] \right) dx = - \int_0^{\frac{\pi}{2}} \operatorname{sen} x \, dx \\ &= - \left[\cos x \right]_0^{\frac{\pi}{2}} = - \left[\cos \frac{\pi}{2} - \cos 0 \right] \\ &= - \left[0 - 1 \right] = 1 \end{aligned}$$

grados
DEG.
 $2\pi = 360^\circ$





$$\int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \sin(x) \cos(y) dx dy$$



Ir

Pasos

Ejemplos



$$\int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \sin(x) \cos(y) dx dy$$



Solución

1

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

$$\begin{aligned} & \int_1^4 \int_1^2 \left(\frac{x}{y} + \frac{y}{x} \right) dy dx \\ &= \int_1^4 \left(\int_1^2 \frac{x}{y} dy + \int_1^2 \frac{y}{x} dy \right) dx = \int_1^4 \left(x \int_1^2 \frac{1}{y} dy + \frac{1}{x} \int_1^2 y dy \right) dx \\ & \int \frac{dv}{v} = \ln|v| \quad \int v^n dv = \frac{v^{n+1}}{n+1} \\ &= \int_1^4 \left(x (\ln|y|)_1^2 \right) + \frac{1}{x} \left(\frac{y^2}{2} \Big|_1^2 \right) dx \end{aligned}$$

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Día Mes Año

Folio

Tema:

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

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

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

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

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

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

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

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

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

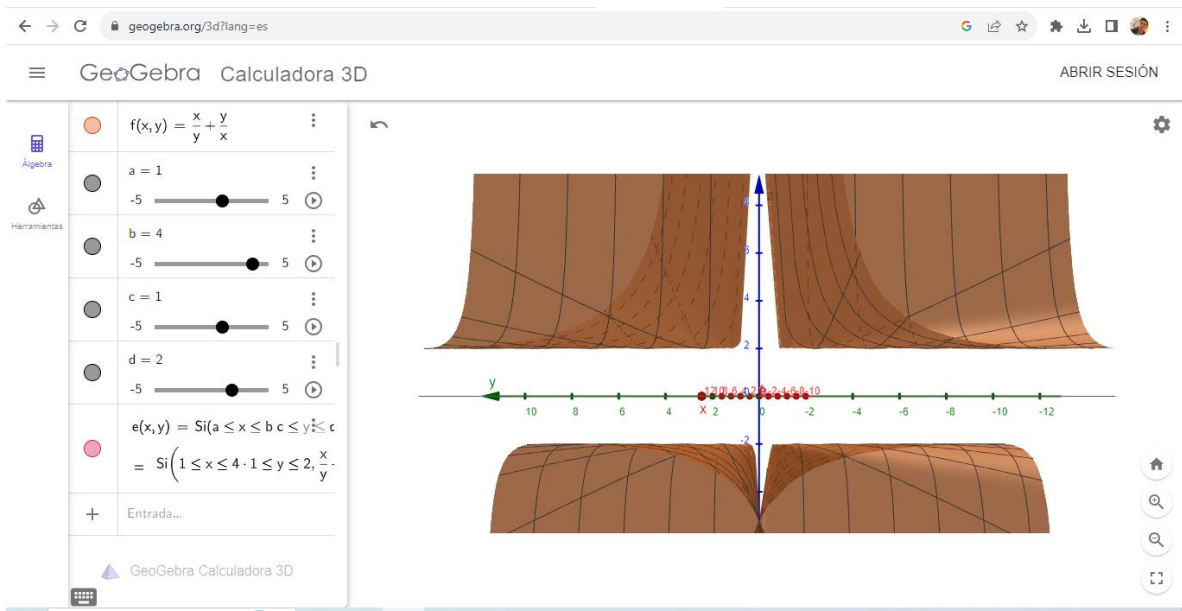
$$= \int_1^2 \left(y (\ln |x| \Big|_1^4) + \frac{1}{y} \left(\frac{x^2}{2} \Big|_1^4 \right) \right) dy$$

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

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

$$= \ln 4 \left(\frac{y^2}{2} \Big|_1^2 \right) + \frac{15}{2} (\ln 2 - \ln 1) = \ln 4 \left(\frac{3}{2} \right) + \frac{15}{2} (\ln 2) = \frac{3}{2} \ln 4 + \frac{15}{2} \ln 2$$

$$= \frac{3}{2} \ln 4 + \frac{15}{2} \ln 2 = \left| \frac{21}{2} \ln 2 = 7.278045 \right|$$



$\int_1^4 \int_1^2 \frac{x}{y} + \frac{y}{x} dy dx$

Pasos Ejemplos

$\int_1^4 \int_1^2 \frac{x}{y} + \frac{y}{x} dy dx$

Solución

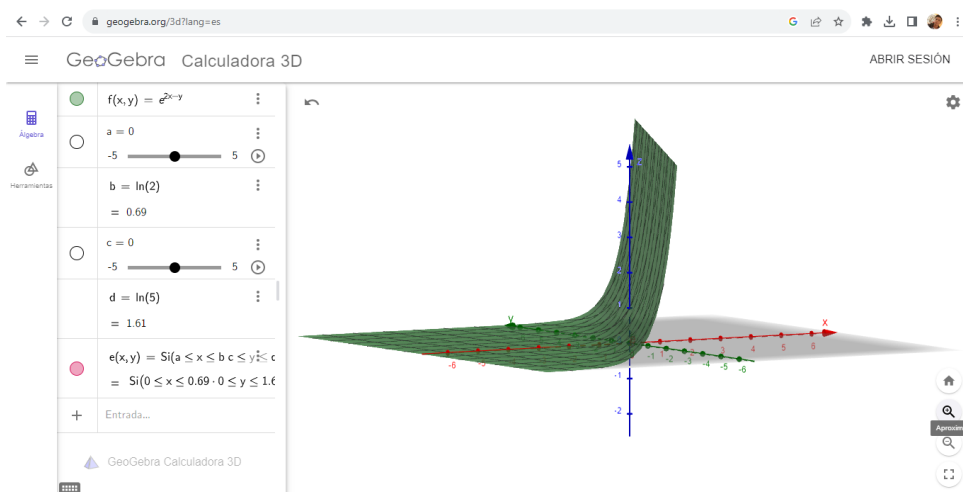
$\frac{21}{2} \ln(2)$

Ocultar pasos

3) $\int_0^{\ln 2} \int_0^{\ln 5} e^{2x-y} dx dy$

$$3^{\circ} = \int_0^{\ln 2} \int_0^{\ln 5} e^{2x-y} dx dy$$
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$$\begin{aligned}
 &= \int_0^{\ln 2} \left[\int_0^{\ln 5} e^{2x-y} dx \right] dy \\
 &= \int_0^{\ln 2} e^{2x-y} dx = \frac{1}{2} e^{2x-y} = \frac{1}{2} e^{2 \ln 5 - y} - \frac{1}{2} e^{-y} \\
 &= \frac{1}{2} e^{2 \ln 5 - y} - \frac{1}{2} e^{-y} = \frac{1}{2} \cdot 25 e^{-y} - \frac{1}{2} e^{-y} \\
 &= \frac{25}{2} e^{-y} - \frac{1}{2} e^{-y} = \frac{24}{2} e^{-y} = 12 e^{-y} \\
 &= \int_0^{\ln 2} 12 e^{-y} dy = 12 e^{-y} + 12 = -12 \cdot \frac{1}{2} + 12 \\
 &= -\frac{12}{2} + 12 = -6 + 12 = 6
 \end{aligned}$$



$$\int_0^{\ln 2} \int_0^{\ln 5} e^{2x-y} dx dy$$



Ir

Pasos

Ejemplos



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



Solución

6

Ocultar pasos