Es 6* $\vec{r}(\theta) = (3\cos\theta, 4\,\mathrm{sen}\,\theta)$ $\theta \in [0, 2\pi]$ $\vec{r}\,'(\theta) = (-3\,\mathrm{sen}\,\theta, 4\cos\theta)$

$$I = \iint_\Omega dx\,dy = \int_0^{2\pi} (0, 3\cos\theta) \cdot (-3\,\mathrm{sen}\,\theta, 4\cos\theta)\,d\theta$$ poiché ho usato

$\vec{F} = (P, Q) = (0, x)$ e la

Formula Gauss-Green

$$\iint_\Omega (\partial_x Q - \partial_y P)\,dx\,dy = \int_{\partial\Omega^+} \vec{F} \cdot d\vec{r} = \int_{\partial\Omega^+} \vec{F} \cdot \vec{r}\,'\,d\theta$$

$$\Rightarrow I = \int_0^{2\pi} 12\cos^2\theta\,d\theta = 12 \int_0^{2\pi} \frac{1+\cos 2\theta}{2}\,d\theta = 6 \cdot 2\pi = 12\pi$$

$= \pi a b$

$= \pi\, 3 \cdot 4$

ok!

$$\cos^2\theta = \frac{1+\cos 2\theta}{2}$$

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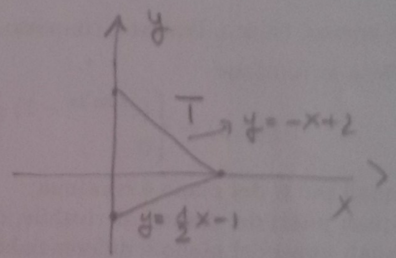
$$I = \iint_T 3|y|\,x\,dx\,dy$$



$$y = -1 + \frac{1}{2}x$$
$$y = 2 - x$$

$$I = 3\int_0^2 dx\,x \int_{\frac{1}{2}x-1}^{2-x} |y|\,dy =$$

$$= 3\int_0^2 dx\,x \left[-\int_{1/2 x-1}^{0} y\,dy + \int_0^{2-x} y\,dy \right] =$$

$$= 3\int_0^2 dx\,x \left[\frac{1}{2}\left(\frac{1}{2}x-1\right)^2 + \frac{1}{2}(2-x)^2 \right] =$$

$$= \frac{3}{2}\int_0^2 dx\,x \Big(\underbrace{\frac{1}{4}x^2 + 1 - x + 4 - 4x + x^2}_{\frac{5}{4}x^2 - 5x + 5} \Big) = \frac{15}{2}\int_0^2 dx \left(\frac{x^3}{4} - x^2 + x \right)$$

$$= \frac{15}{2}\left(\frac{1}{16} \cdot 16 - \frac{1}{3}\,8 + \frac{1}{2}\,4 \right) = \frac{15}{2}\Big(\underbrace{1 - \frac{8}{3} + 2}_{1/3} \Big) = \frac{5}{2}$$