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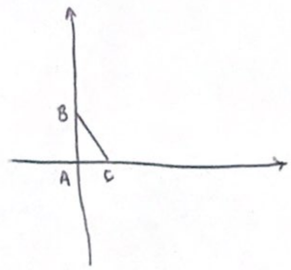
1a $\iint_R x^2+y^2 \, dxdy$ A(0,0) , B(0,1), C(1,0)



triângulo ABC: eixo x: da reta $y=1$ até $y=0$ ←

eixo y: da reta $x=1-y$ até reta $x=0$ ↓

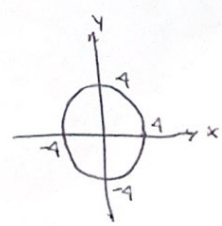
$$\int_0^1 \int_0^{1-y} x^2+y^2 \, dxdy = \int_0^1 \left(\frac{x^3}{3} + xy^2\right)\Bigg|_0^{1-y} dy$$

$$= \int_0^1 \frac{(1-y)^3}{3} + (1-y)y^2 = \int_0^1 \frac{(1-y)^3}{3} + y^2 - y^3 \, dy$$

$$= \left(-\frac{(y-1)^4}{12} + \frac{y^3}{3} - \frac{y^4}{4}\right)\Bigg|_0^1 = 0 + \frac{1}{3} - \frac{1}{4} + \frac{1}{12} - 0 + 0 = \frac{4-3+1}{12} = \frac{2}{12} = \boxed{\frac{1}{6} \text{ u.v}}$$

b) $\iint_R 9 - x^2 - y^2 \, dydx$ (R) $r=4$ $\boxed{\begin{array}{l} x^2+y^2=16 \\ 9-x^2-y^2 = 9-r^2 \end{array}}$

$$\iint_R 9-x^2-y^2 \, dydx = \int_{r_1}^{r_2}\int_{\theta_1}^{\theta_2} r \, d\theta \, dr$$



$$\int_0^4 \int_0^{2\pi} (9-r^2) r \, d\theta dr = \int_0^4 \int_0^{2\pi} 9r - r^3 \, d\theta \, dr = \int_0^4 \left(9r\theta - r^3\theta\right)\Bigg|_0^{2\pi} dr$$

$$= \int_0^4 (9r - r^3) \, 2\pi \, dr = 2\pi \int_0^4 9r - r^3 \, dr = 2\pi \left(\frac{9r^2}{2} - \frac{r^4}{4}\right)\Bigg|_0^4$$

$$= 2\pi\left(\frac{9.16}{2} - \frac{256}{4}\right) = 2\pi(72-64) = 2\pi . 8 = 16\pi$$