Continuação do ex. 26

$$\begin{cases} x = \dfrac{-17 \pm \sqrt{(17)^2 - 4(16)}}{2} \\ \_\_\_ \end{cases} \qquad \begin{cases} x = -1 \vee x = -16 \\ y = 1 \vee y = \dfrac{4-16}{3} = -4 \end{cases} \qquad P_1(-1,1) \text{ e } P_2(1,-4)$$

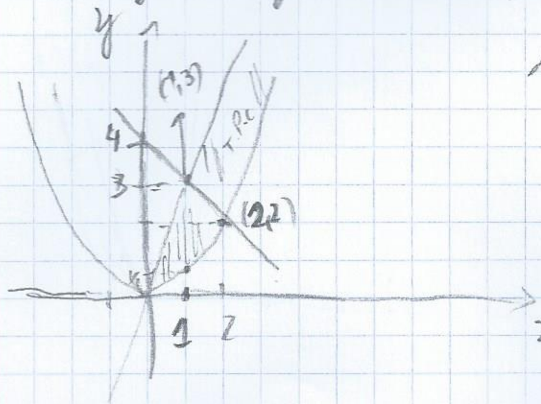
$$\text{Área} = \int_{-16}^{-1}\int_{-\sqrt{-x}}^{\frac{4+x}{3}} dy\,dx + \int_{-1}^{0}\int_{-\sqrt{-x}}^{\sqrt{-x}} dy\,dx = \int_{-16}^{-1}\left(\frac{4+x}{3} - \left(-\sqrt{-x}\right)\right)dx +$$

$$+ \int_{-1}^{0}\left(\sqrt{-x} - \left(-\sqrt{-x}\right)\right)dx$$

Cap. 5 dos compl.

1) A parábola $2y = x^2$ e as rectas $y = 3x$ e $x + y = 4$ limitam duas regiões no 1º quad. Calcule $\iint_D dA$ em que D é uma dessas regiões. O que representa este integral?

Integral representa a área de D



$$\begin{cases} y = 3x \\ y = 4 - x \end{cases}$$

$$\int_0^1\int_{\frac{x^2}{2}}^{3x} dy\,dx + \int_1^2\int_{\frac{x^2}{2}}^{4-x} dy\,dx =$$

$$= \int_0^1 \left[y\right]_{\frac{x^2}{2}}^{3x} dx + \int_1^2\left(4 - x - \frac{x^2}{2}\right)dx =$$

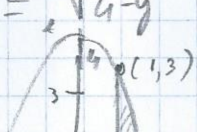
$$= \left[3\frac{x^2}{2} - \frac{x^3}{6}\right]_0^1 + \left[4x - \frac{x^2}{2}\right]_0^1 + \left[4x - \frac{x^2}{2} - \frac{x^3}{6}\right]$$ acabar t.p.c.

2) Inverta a ordem de integração e calcule o integ.

$$\int_0^3\int_1^{\sqrt{4-y}} (x+2y)\,dx\,dy = \iint (x+2y)\,dy\,dx = \int_1^2\int_0^{4-x^2}(x+2y)\,dy\,dx$$

$$1 \leq x \leq \sqrt{4-y} \qquad 0 \leq y \leq 3$$

T.P.C.



$$x^2 = 4 - y, \quad x^2 = 4 - 3$$
$$-y = x^2 - 4$$