

# PROVA 1 - CÁLCULO 1

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①  $r^1 \Rightarrow 3x - y = -6$      $r^2 \Rightarrow -6x + 11y = -42$      $r^3 \Rightarrow -6x - 7y = -42$

$-y = -6 - 3x \cdot (-1)$      $11y = 6x - 42$      $-7y = -42 + 6x \cdot (-1)$

$y = 6 + 3x$      $y = \frac{6x - 42}{11}$      $y = \frac{42 - 6x}{7}$

$x = \frac{y - 6}{3}$      $-6x = -42 - 11y \cdot (-1)$      $-6x = -42 + 7y \cdot (-1)$

$x = \frac{42 + 11y}{6}$      $6x = 42 - 7y$

$x = \frac{42 - 7y}{6}$

$r^1$      $r^2$      $r^3$

$y = 6 + 3x$      $y = \frac{6x - 42}{11}$      $y = \frac{42 - 6x}{7}$

$x = \frac{y - 6}{3}$      $x = \frac{42 + 11y}{6}$      $x = \frac{42 - 7y}{6}$

$6 + 3x = \frac{6x - 42}{11} \Rightarrow 66 + 33x = 6x - 42 \Rightarrow 27x = -108$

$x = -4$

$y = 6 + 3(-4) \Rightarrow y = 6 - 12 \Rightarrow y = -6$      $r^1 r^2 = (-4, -6)$

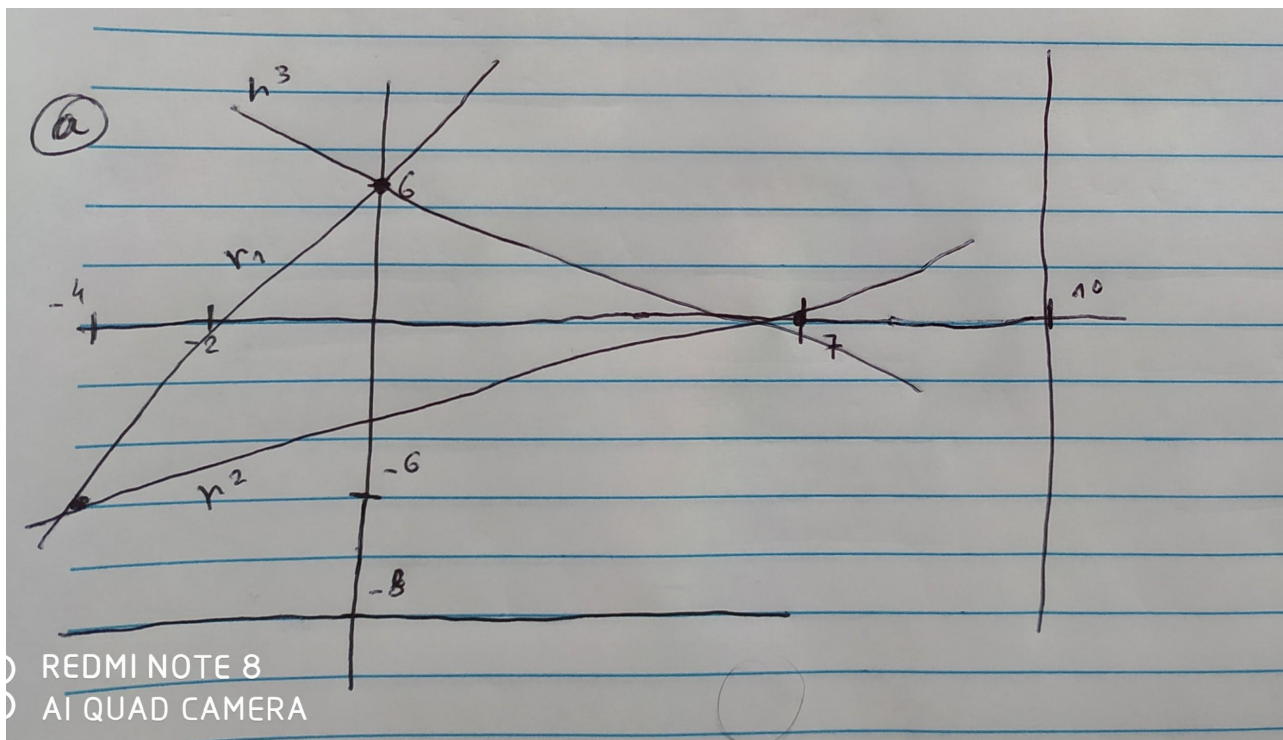
$6 + 3x = \frac{42 - 6x}{7} \Rightarrow 42 + 21x = 42 - 6x \Rightarrow 27x = 0 \Rightarrow x = 0$

$y = 6 + 3 \cdot 0 \Rightarrow y = 6$      $r^1 r^3 = (0, 6)$

$\frac{6x - 42}{11} = \frac{42 - 6x}{7} \Rightarrow 42x - 294 = 162 - 66x \Rightarrow 108x = 456$

$x = 7$

$y = \frac{6 \cdot 7 - 42}{11} \Rightarrow y = \frac{42 - 42}{11} \Rightarrow y = 0$      $r^2 r^3 = (7, 0)$



(b)  $\pi \int_{-4}^0 (6+3x - (-6))^2 dx + \pi \int_0^7 \left( \frac{4-6x}{7} - (-6) \right)^2 dx + \pi \int_{-4}^7 \left( \frac{6x-42}{11} - (-6) \right)^2 dx$

(c)  $\pi \int_{-6}^6 \left( \frac{y-6}{3} - 10 \right)^2 dy - \pi \int_{-6}^0 \left( \frac{42+11y}{6} - 10 \right)^2 dy - \pi \int_0^6 \left( \frac{42-7y}{6} - 10 \right)^2 dy$

(2)  $\int_1^2 \frac{2x dx}{\sqrt[3]{x^2-4}} \Rightarrow \lim_{b \rightarrow 2} \int_1^b \frac{2x dx}{\sqrt[3]{x^2-4}}$

$\begin{cases} u = x^2 - 4 \\ du = 2x \\ dx \end{cases} \quad d = \frac{du}{2x} = \frac{1}{2x} du$

$\lim_{b \rightarrow 2} \int_1^b \frac{2x}{\sqrt[3]{u}} \cdot \frac{du}{2x} \Rightarrow \lim_{b \rightarrow 2} \int_1^b \frac{1}{\sqrt[3]{u}} du \Rightarrow \lim_{b \rightarrow 2} \int_1^b \frac{1}{u^{1/3}} du \Rightarrow$

$\lim_{b \rightarrow 2} \left( \frac{u^{-1/3+1}}{-1/3+1} \right)_1^b \Rightarrow \lim_{b \rightarrow 2} \left( \frac{u^{2/3}}{2/3} \right)_1^b \Rightarrow \lim_{b \rightarrow 2} \left( \frac{3 u^{2/3}}{2} \right)_1^b \Rightarrow \lim_{b \rightarrow 2} \left( \frac{3 (x^2-4)^{2/3}}{2} \right)_1^b$

$\lim_{b \rightarrow 2} \left( \frac{3 (b^2-4)^{2/3}}{2} - \frac{3 (1^2-4)^{2/3}}{2} \right) \Rightarrow \frac{3 (2^2-4)^{2/3}}{2} - \frac{3 (1^2-4)^{2/3}}{2} \Rightarrow \frac{3(0)^{2/3}}{2} - \frac{3(-3)^{2/3}}{2} \Rightarrow$

$\frac{0 - 3\sqrt[3]{9}}{2} \Rightarrow \boxed{\frac{-3\sqrt[3]{9}}{2}} \quad \text{Converge}$