PROVA 1 - CÁLCULO 2

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

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

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

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

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

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

r^1 $\quad$ r^2 $\quad$ r^3

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

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

$\boxed{x = -4}$

$y = 6 + 3(-4) \Rightarrow y = 6 - 12 \Rightarrow \boxed{y = -6}$ $\quad$ $r^1 r^2 = (4, 18)$

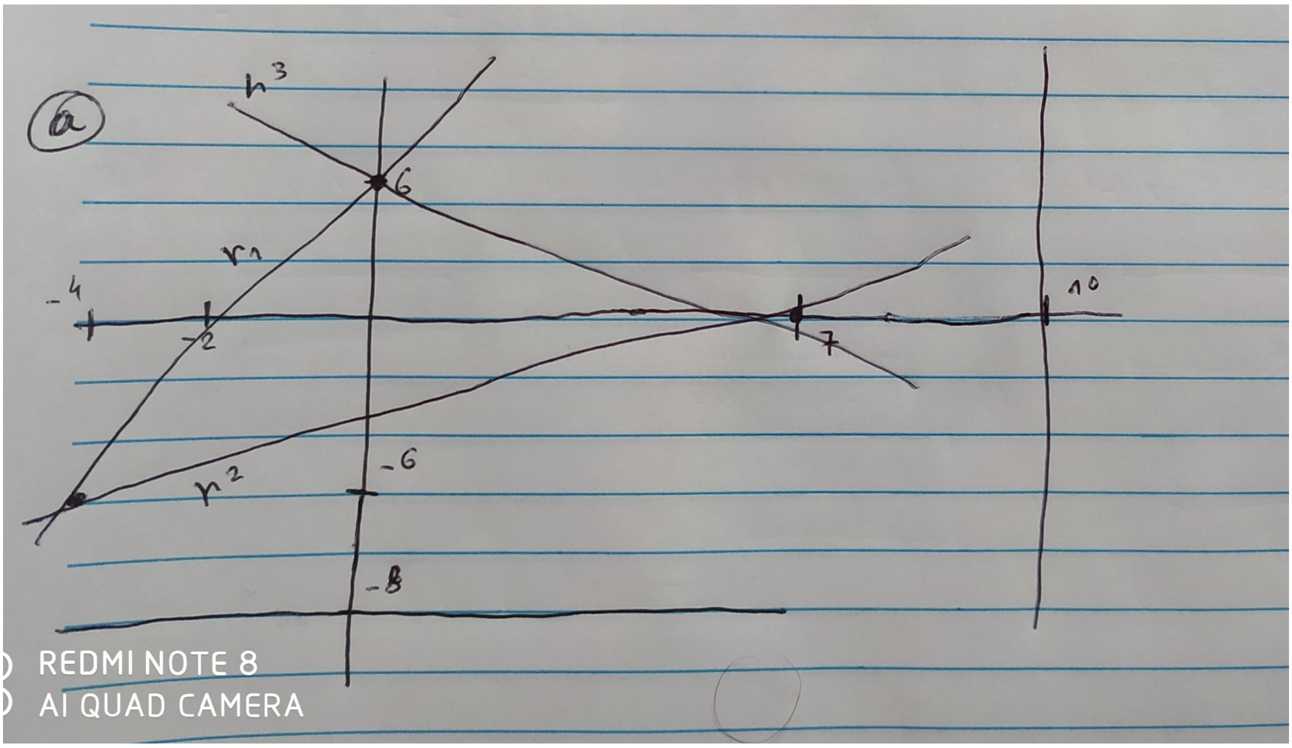
$6 + 3x = \frac{42 - 6x}{7} \Rightarrow 42 + 21x = 42 - 6x \Rightarrow 27x = 0 \Rightarrow \boxed{x = 0}$

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

$\frac{6x - 42}{11} = \frac{42 - 6x}{7} \Rightarrow 42x - 294 = 462 - 66x \Rightarrow 108x = 756$

$\boxed{x = 7}$

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



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

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

(2) $\int_1^2 \frac{2x}{\sqrt[3]{x^2-4}}\,dx \Rightarrow \lim_{b\to2}\int_1^b \frac{2x}{\sqrt[3]{x^2-4}}\,dx \Rightarrow$

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

$$\lim_{b\to2}\int_1^b \frac{\cancel{2x}}{\sqrt[3]{u}}\cdot\frac{du}{\cancel{2x}} \Rightarrow \lim_{b\to2}\int_1^b \frac{1}{\sqrt[3]{u}}\,du \Rightarrow \lim_{b\to2}\int_1^b \frac{1}{u^{\frac{1}{3}}}\,du \Rightarrow$$

$$\lim_{b\to2}\left(\frac{u^{-\frac{1}{3}+1}}{-\frac{1}{3}+1}\right)_1^b \Rightarrow \lim_{b\to2}\left(\frac{u^{2/3}}{2/3}\right)_1^b \Rightarrow \lim_{b\to2}\left(\frac{3u^{2/3}}{2}\right)_1^b \Rightarrow \lim_{b\to2}\left(\frac{3(x^2-4)^{2/3}}{2}\right)_1^b$$

$$\lim_{b\to2}\left(\frac{3(b^2-4)^{2/3}}{2}-\frac{3(1^2-4)^{2/3}}{2}\right) \Rightarrow \frac{3(2^2-4)^{2/3}}{2}-\frac{3(1^2-4)^{2/3}}{2} \Rightarrow \frac{3(0)^{2/3}-3\cdot(-3)^{2/3}}{2} \Rightarrow$$

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

Converge