

TAREFA 07 - MÉTODOS NUMÉRICOS II

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1) Função 1 $I = \int_{-1}^1 \frac{dx}{\sqrt[3]{x^2}} = 6$

→ Exp. SIMPLES:

$$\int_{-\infty}^{+\infty} \frac{1}{\sqrt[3]{\left(-\frac{1+t}{2} + \frac{1+t}{2} \cdot \tanh(x)\right)^2}} \cdot \frac{1+t}{2} \cdot \frac{1}{(\cosh(x))^2} dx =$$

$$= \int_{-\infty}^{+\infty} \frac{1}{\sqrt[3]{(\tanh(x))^2}} \cdot \frac{1}{(\cosh(x))^2} dx$$

→ Exp. Dupla:

$$\int_{-\infty}^{+\infty} \frac{dx}{\sqrt[3]{\left(-\frac{1+t}{2} + \frac{1+t}{2} \cdot \tanh\left(\sinh(x) \frac{\pi}{2}\right)\right)^2}} \cdot \frac{1+t}{2} \cdot \left[\frac{\pi}{2} \cdot \frac{\cosh(x)}{\cosh\left(\frac{\pi}{2} \cdot \sinh(x)\right)} \right]$$

$$= \int_{-\infty}^{+\infty} \frac{1}{\sqrt[3]{\left(\tanh\left(\sinh(x) \cdot \frac{\pi}{2}\right)\right)^2}} \cdot \left[\frac{\pi}{2} \cdot \frac{\cosh(x)}{\cosh\left(\frac{\pi}{2} \cdot \sinh(x)\right)} \right] \cdot dx$$

2) Função 2 $I = \int_{-2}^0 \frac{dx}{\sqrt{4-x^2}} = \frac{\pi}{2}$

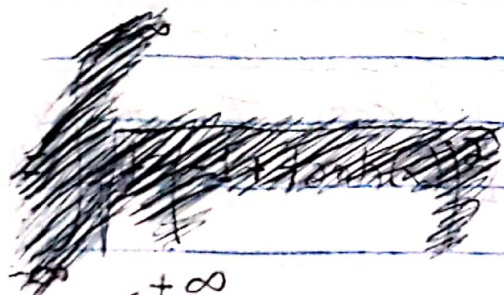
→ Exp. SIMPLER:

$$\int_{-\infty}^{+\infty} \frac{1}{\sqrt{4 - \left(\frac{-2}{2} + \frac{2}{2} \tanh(x)\right)^2}} \cdot \frac{2}{2} \cdot \frac{1}{(\cosh(x))^2} \cdot dx =$$

$$= \int_{-\infty}^{+\infty} \frac{1}{\sqrt{4 - (-1 + \tanh(x))^2}} \cdot \frac{1}{(\cosh(x))^2} dx$$

→ Exp. Dupla:

$$\int_{-\infty}^{+\infty} \frac{dx}{\sqrt{4 - \left(\frac{-2}{2} + \frac{2}{2} \tanh\left(\frac{\pi}{2} \sinh(x)\right)\right)^2}} \cdot \frac{2}{2} \cdot \left[\frac{\pi}{2} \cdot \frac{\cosh(x)}{\left(\cosh\left(\frac{\pi}{2} \sinh(x)\right)\right)^2} \right] =$$



$$= \int_{-\infty}^{+\infty} \frac{dx}{\sqrt{4 - \left(-1 + \tanh\left(\frac{\pi}{2} \sinh(x)\right)\right)^2}} \cdot \left[\frac{\pi}{2} \cdot \frac{\cosh(x)}{\left(\cosh\left(\frac{\pi}{2} \sinh(x)\right)\right)^2} \right]$$