TAREFA 07 - MÉTODOS NUMÉRICOS II

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

→ Exp. Simples:

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

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

→ Exp. Dupla:

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

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

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

→ Exp. Simples:

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

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

→ Exp. Dupla:

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

[redacted]

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