

Samuel Bastos
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ANOTAÇÃO.
 $\lim_{\substack{x \rightarrow \infty \\ x \rightarrow -\infty}} \left(1 + C \cdot \frac{1}{x}\right)^x = e^C$
e⁹: 8,103.083928 ...

Avaliação Parcial - Cálculo

01. Determine o seguinte valor do limite:

$$\lim_{x \rightarrow \infty} \left(\frac{5x + 13}{5x - 11} \right)^{\frac{15x}{8}} = \lim_{x \rightarrow \infty} \left(\frac{\frac{5x + 13}{5x}}{\frac{5x - 11}{5x}} \right)^{\frac{15x}{8}} =$$

$$= \left[\frac{\frac{5x}{5x} + \frac{13}{5x}}{\frac{5x}{5x} - \frac{11}{5x}} \right]^{X \cdot \frac{15}{8}} = \left[\frac{\left(1 + \frac{13}{5} \cdot \frac{1}{x}\right)^X}{\left(1 + \left(\frac{-11}{5x}\right) \cdot \frac{1}{x}\right)^X} \right]^{\frac{15}{8}} = \left[\frac{e^{\frac{13}{5}}}{e^{\frac{-11}{5}}} \right]^{\frac{15}{8}} =$$

$$\left[e^{\frac{13}{5} - \left(\frac{-11}{5}\right)} \right]^{\frac{15}{8}} = \left[e^{\frac{24}{5}} \right]^{\frac{15}{8}} = e^{\frac{24}{5} \cdot \frac{15}{8}} = e^9$$

02. $\lim_{x \rightarrow \infty} \frac{\tan 6x - \sec 6x}{x^3} = \frac{\sec 6x - \frac{\sec 6x}{\cos 6x}}{x^3} =$

$$= \frac{\sec 6x \cdot (\cos 6x - \sec 6x)}{\cos 6x} = \frac{\sec 6x (\cos 6x - 1) \cdot (\cos 6x + 1)}{x^3 \cos 6x (\cos 6x + 1)} =$$

$$\frac{x^3}{1}$$

$$\frac{\sec 6x (\cos^2 6x - 1)}{x^3 \cos 6x (\cos 6x + 1)} = \frac{\sec 6x \cdot (-\sec^2 6x)}{x^3 \cos 6x (\cos 6x + 1)} =$$

$$\frac{-\sec^3 6x}{x^3 \cos 6x (\cos 6x + 1)} = \frac{\sec 6x}{x^3} \cdot \frac{\sec 6x}{x^3} \cdot \frac{\sec 6x}{x^3} \cdot \frac{(-1)}{\cos 6x (\cos 6x + 1)}$$

data
fecha

D S T Q Q S S
D L M M J V S

$$\left(6 \cdot \frac{\cancel{\sin 6x}}{\cancel{6x}}\right) \cdot \left(6 \cdot \frac{\cancel{\sin 6x}}{\cancel{6x}}\right) \cdot \left(6 \cdot \frac{\cancel{\sin 6x}}{\cancel{6x}}\right) \cdot \frac{(-1)}{\cos 6x (\cos 6x + 1)} =$$

$$6 \cdot 6 \cdot 6 \cdot \frac{(-1)}{2} = \frac{-216}{2} = \boxed{-108}$$