AM 117

$$f : R \to R$$

$$f(x) = x - tgx$$

$$\lim_{x \to 0} \frac{f(tgx)}{x^3} = \lim_{x \to 0} \frac{tgx - tg(tgx)}{x^3} = \lim_{x \to 0} \frac{\dfrac{1}{\cos^2 x} - \dfrac{1}{\cos^2(tgx)} \cdot \dfrac{1}{\cos^2 x}}{3x^2} = \lim_{x \to 0} \frac{1 - \dfrac{1}{\cos^2(tgx)}}{3x^2} =$$

$$= \frac{1}{3} \lim_{x \to 0} \frac{\cos^2(tgx) - 1}{x^2} = -\frac{1}{3} \lim_{x \to 0} \frac{\sin^2(tgx)}{x^2} = -\frac{1}{3} \lim_{x \to 0} \frac{\sin^2(tgx)}{tg^2 x} \cdot \frac{tg^2 x}{x^2} = -\frac{1}{3}$$

d