$$\lim_{x \to 0} \frac{\ln(1+x) - x}{\tan^2 x} = \left(\frac{0}{0}\right)$$

L.R.

$$\Rightarrow \lim_{x \to 0} \frac{(\ln(1+x) - x)'}{(\tan^2 x)'} = \lim_{x \to 0} \frac{\frac{1}{1+x} - 1}{\frac{2 \tan x}{\cos^2 x}} = \left(\frac{0}{0}\right) \overset{L.R.}{\Rightarrow}$$

L.R.

$$= \lim_{x \to 0} \frac{\left(\cos^2 x \left(\frac{1}{1+x} - 1\right)\right)'}{(2 \tan x)'} = \lim_{x \to 0} \frac{-2\cos x \cdot \sin x \left(\frac{1}{1+x} - 1\right) + \cos^2 x \cdot \left(\frac{-1}{(1+x)^2}\right)}{\frac{2}{\cos^2 x}}$$

$$\overset{\to 1}{}$$

$$= \lim_{x \to 0} \frac{-1}{2} = -\frac{1}{2}$$

$$\underline{\text{Answer: } -\frac{1}{2}}$$

Dmitry Beresnev

d.Beresnev@innopolis.university

B20-02   18.03.2002

$\boxed{V1}$