

LIMITE NOTTEVOLFE TRIGONOMETRICO

Note Title

10/2/2019

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = 1 \quad \text{ricordo di usare } \lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$\begin{aligned} \frac{1 - \cos x}{x^2} &= \frac{(1 - \cos x)(1 + \cos x)}{x^2} \cdot \frac{1}{1} \cdot \frac{1}{(1 + \cos x)} = \frac{1 - \cos^2 x}{x^2} \cdot 2 \cdot \frac{1}{1 + \cos x} \\ &\stackrel{\substack{\text{MOLTIPLICO} \\ \text{E DIVIDO PER } (1 + \cos x)}}{\uparrow}{=} \frac{(1 - \cos^2 x)^2}{x^2} \cdot 2 \cdot \frac{1}{1 + \cos x} \\ &= \frac{(1 - \cos x)^2}{x^2} \cdot 2 \cdot \frac{1}{1 + \cos x} = \left(\frac{\sin x}{x}\right)^2 \cdot 2 \cdot \frac{1}{1 + \cos x} \xrightarrow{x \rightarrow 0} 1 \end{aligned}$$