

Hacemos los límites en el caso real

Indeterminación $\frac{0}{0}$

$$\lim_{x \rightarrow 0} \frac{x - \sin x}{x^2} \stackrel{\frac{0}{0}}{=} \lim_{x \rightarrow 0} \frac{1 - \cos x}{2x} \stackrel{\text{Regla de L'Hôpital}}{=} \lim_{x \rightarrow 0} \frac{\sin x}{2} = 0$$

Indeterminación $\frac{0}{0}$

$$\lim_{x \rightarrow 0} \frac{2 \sin^2 x - x \sin 2x}{x^4} \stackrel{\frac{0}{0}}{=} \lim_{x \rightarrow 0} \frac{2 \cdot 2 \sin x \cos x - \sin 2x - x \cos 2x \cdot 2}{4x^3} \stackrel{\text{Regla de L'Hôpital}}{=} =$$

$$= \lim_{x \rightarrow 0} \frac{2 \sin 2x - \sin 2x - 2x \cos 2x}{4x^3} = \lim_{x \rightarrow 0} \frac{\sin 2x - 2x \cos 2x}{4x^3} \stackrel{\text{Indeterminación } \frac{0}{0}}{=} \stackrel{\text{Regla de L'Hôpital}}{=} =$$

$$= \lim_{x \rightarrow 0} \frac{2 \cos 2x - 2 \cos 2x + 2x \sin 2x \cdot 2}{4 \cdot 3x^2} = \lim_{x \rightarrow 0} \frac{x \sin 2x}{3x^2} =$$

$$= \lim_{x \rightarrow 0} \frac{\sin 2x}{3x} \stackrel{\text{Ind. } \frac{0}{0}}{=} \stackrel{\text{Regla L'Hôpital}}{=} \lim_{x \rightarrow 0} \frac{2 \cos 2x}{3} = \frac{2}{3}$$