Ejercicio 16

e) $A =]0, \frac{\pi}{2}[, \ f(x) = \left(\frac{1}{\operatorname{tg} x}\right)^{\operatorname{sen} x} \quad (x \in A), \quad \alpha = \frac{\pi}{2}.$

$$\lim_{x \to \frac{\pi}{2}^-} \left(\frac{1}{\operatorname{tg} x}\right)^{\operatorname{sen} x} = \lim_{x \to \frac{\pi}{2}^-} \left(\frac{\cos x}{\operatorname{sen} x}\right)^{\operatorname{sen} x} = \left(\frac{\cos \frac{\pi}{2}}{\operatorname{sen} \frac{\pi}{2}}\right)^{\operatorname{sen} \frac{\pi}{2}} = \left(\frac{0}{1}\right)^1 = 0$$

cuando x va hacia $\frac{\pi}{2}$ por la izquierda la función va a 0.

f) $A =]0, \frac{\pi}{2}[, \ f(x) = (1 + \operatorname{sen} x)^{\operatorname{cotg} x} \quad (x \in A), \quad \alpha = 0.$

$$\lim_{x \to 0^+} (1 + \operatorname{sen} x)^{\frac{1}{\operatorname{tg} x}} = \lim_{x \to 0^+} e^{\frac{\ln(1 + \operatorname{sen} x)}{\operatorname{tg} x}} =$$

$$= \lim_{x \to 0^+} e^{\lim_{x \to 0^+} \frac{\ln(1 + \operatorname{sen} x)}{\operatorname{tg} x}} = e^1 = e$$

$$\lim_{x \to 0^+} \frac{\ln(1 + \operatorname{sen} x)}{\operatorname{tg} x} = \left[\frac{0}{0}\right] \text{“=”} \lim_{x \to 0^+} \frac{\frac{\cos x}{1 + \operatorname{sen} x}}{1 + \operatorname{tg}^2 x} = \frac{1}{1} = 1$$