

Problema 1 Calcular los siguientes límites:

1. $\lim_{x \rightarrow -\infty} \frac{(x+1)^2}{e^x} = \infty$

2. $\lim_{x \rightarrow \infty} \frac{(x+1)^2}{e^x} = 0$

3. $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 2x} - x) = 1$

4. $\lim_{x \rightarrow 0} \frac{x \sin x}{1 - \cos x} = 2$

5. $\lim_{x \rightarrow 0} \frac{\ln(\cos(3x))}{\ln(\cos(2x))} = \frac{9}{4}$

6. $\lim_{x \rightarrow 0} \frac{\sqrt{4+x} - \sqrt{4-x}}{4x} = \frac{1}{8}$

7. Dadas las funciones $f(x) = (x+1)^2$, $g(x) = (x-1)^2$ y $h(x) = \sin x$.
Calcular

(a) $\lim_{x \rightarrow 0} \frac{f(x) - 1}{h(x)} = 2$

(b) $\lim_{x \rightarrow 0} \frac{f(x) - 1}{g(x) - 1} = 1$

(c) $\lim_{x \rightarrow 0} \frac{f(x) + g(x) - 2}{[h(x)]^2} = 2$

8. $\lim_{x \rightarrow 0} \frac{\ln(\cos x)}{\sin^2 x} = -\frac{1}{2}$