

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