

Problema 1 Calcular los siguientes límites:

1. $\lim_{x \rightarrow -\infty} \frac{-3x^5 + 2x^2 - 1}{2x^3 - x - 1} = -\infty$
2. $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 1} - \sqrt{x - 1}) = \infty$
3. $\lim_{x \rightarrow \infty} \left(\frac{2x - 1}{2x + 2} \right)^{\frac{3x-1}{2}} = e^{-9/4}$
4. $\lim_{x \rightarrow -\infty} \left(\frac{2x + 1}{x} \right)^{x^2 - 1} = +\infty$
5. $\lim_{x \rightarrow \infty} \left(\frac{5x + 6}{10x - 1} \right)^{\frac{x+1}{2}} = 0$
6. $\lim_{x \rightarrow 2} \frac{\sqrt{x - 1} - \sqrt{x^2 - 3}}{x - 2} = -\frac{3}{2}$
7. $\lim_{x \rightarrow 1} \frac{x^7 - 1}{x^5 - 1} = \frac{7}{5}$
8. $\lim_{x \rightarrow \infty} (\sqrt{x} - \sqrt{x - 1}) = 0$
9. $\lim_{x \rightarrow 0} \frac{\ln \cos x}{\ln(1 + \sin x)} = 0$
10. $\lim_{x \rightarrow 1} \frac{\ln x^2}{\cos(\frac{\pi}{2}x)} = -\frac{4}{\pi}$
11. $\lim_{x \rightarrow \infty} \frac{e^{x-1}}{\ln x} = \infty$
12. $\lim_{x \rightarrow 0} \left(\frac{x}{x^2 - 1} - \frac{1}{x + 1} \right) = -1$
13. $\lim_{x \rightarrow 0} \frac{\ln(1 + \sin^2 x)}{\ln(1 + \tan x)} = 0$
14. $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{\sin x} = 2$
15. $\lim_{x \rightarrow \pi} \frac{\ln(2 + \cos x)}{\sin x} = 0$

$$16. \lim_{x \rightarrow 5} \frac{\sqrt{2x-1} - 3}{\sqrt{3x+10} - x} = -\frac{10}{21}$$

$$17. \lim_{x \rightarrow 1} \frac{\tan(x^2 - 1)}{x - \sin\left(\frac{\pi}{2}x\right)} = 2$$

$$18. \lim_{x \rightarrow \infty} \frac{3x^2 + x - 1}{x^3 + 2} = 0$$

$$19. \lim_{x \rightarrow \infty} \left(\frac{3x^2 + x - 1}{2x^2 - 1} \right)^{3x} = \infty$$

$$20. \lim_{x \rightarrow \infty} \frac{e^{3x}}{1 + x^2} = \infty$$