

LIMITES

Calcular los siguientes límites:

$$1. \lim_{x \rightarrow \pi/3} \frac{2 \cos^2 x + \cos x - 1}{2 \cos^2 x - 3 \cos x + 1}$$

$$2. \lim_{x \rightarrow a} \frac{\cos x - \cos a}{x - a}$$

$$3. \lim_{x \rightarrow 0} \frac{\operatorname{arctg} 2x}{\operatorname{sen} 3x}$$

$$4. \lim_{x \rightarrow a} \frac{\operatorname{sen} x - \operatorname{sen} a}{x - a}$$

$$5. \lim_{x \rightarrow -2} \frac{\operatorname{tg} \pi x}{x + 2}$$

$$6. \lim_{x \rightarrow 0} \frac{x - \operatorname{sen} x}{x + \operatorname{sen} 3x}$$

$$7. \lim_{x \rightarrow 1} \frac{\cos\left(\frac{\pi}{2}x\right)}{1 - \sqrt{x}}$$

$$8. \lim_{k \rightarrow 0} \frac{\operatorname{sen}(x+k) - \operatorname{sen} x}{k}$$

$$9. \lim_{x \rightarrow 0} \frac{\operatorname{tg} x - \operatorname{sen} x}{1 - \cos x}$$

$$10. \lim_{x \rightarrow \pi/4} \frac{\operatorname{sen} x - \cos x}{1 - \operatorname{tg} x}$$

$$11. \lim_{x \rightarrow 7} \frac{2 - \sqrt{x-3}}{x^2 - 49}$$

$$12. \lim_{x \rightarrow \pi/2} 2 \operatorname{sen} x + \operatorname{cotg} x$$

$$13. \lim_{x \rightarrow 3} \frac{\sqrt{x^2 - 2x + 6} - \sqrt{x^2 + 2x - 6}}{x^2 - 4x + 3}$$

$$14. \lim_{x \rightarrow \infty} \frac{x^3 \operatorname{Ln} x}{e^2}$$

$$15. \lim_{x \rightarrow 2} \log\left(\frac{x^2 + 1}{x^5 + 3x^2 + 6}\right)$$

$$16. \lim_{z \rightarrow 0} \operatorname{Ln}(3 - \sqrt{4-z})$$

$$17. \lim_{x \rightarrow 1} \frac{(\sqrt{2})^x}{\sqrt{x^2 + 2}}$$

$$18. \lim_{t \rightarrow 1} \frac{\sqrt{1+8t}}{t+2}$$

$$19. \lim_{x \rightarrow 1} \frac{2 - x^2}{2 + \sqrt{x^2 + 3}}$$

$$20. \lim_{x \rightarrow 2} \frac{\sqrt{x+1}}{\sqrt[3]{3x+2}}$$

$$21. \lim_{x \rightarrow 6} \frac{\sqrt{2x+1} - 1}{\sqrt{x+2} - \sqrt{2}}$$

$$22. \lim_{x \rightarrow 2} \frac{x^2 - 2x}{x^2 - 4x + 4}$$

$$23. \lim_{t \rightarrow +\infty} \sqrt{t^2 + t} - \sqrt{t^2 + 4}$$

$$24. \lim_{x \rightarrow \pi/2} \frac{\cos x}{x - \pi/2}$$

$$25. \lim_{x \rightarrow 3} \left(\frac{1}{x-3} - \frac{5}{x^2 - x - 6} \right)$$

$$26. \lim_{x \rightarrow \infty} \frac{\sqrt{1-x}}{e^x}$$

$$27. \lim_{x \rightarrow 0} \left[\frac{1}{x^2} + \left(\frac{\ln(x+1)}{x} \right)^2 \right]$$

$$28. \lim_{x \rightarrow 0^+} \frac{\cos x}{x^3}$$

$$29. \lim_{x \rightarrow \infty} \ln(2x+1) - \ln(x+1)$$

$$30. \lim_{x \rightarrow \sqrt{2}} \frac{x^2 - 2}{x^4 - 4}$$

$$31. \lim_{x \rightarrow 2} \frac{3x^2 + 1}{(x-2)^2}$$

$$32. \lim_{x \rightarrow \frac{\pi}{2}^+} \frac{\sqrt{x - \pi/2}}{\operatorname{tg} x}$$

$$33. \lim_{x \rightarrow +\infty} \frac{\operatorname{arctg} x - \pi}{e^{-x}}$$

$$34. \lim_{x \rightarrow \pi/2} \frac{\operatorname{tg} 3x}{\operatorname{tg} x}$$

$$35. \lim_{x \rightarrow 1} \frac{x^5 - 1}{x - 1}$$

$$36. \lim_{x \rightarrow \pi/2} \frac{\cos x}{x - \pi/2}$$

$$37. \lim_{x \rightarrow 2} \frac{x^2 - \sqrt{8x}}{\sqrt{2x} - 2}$$

$$38. \lim_{x \rightarrow \infty} \left(1 + \frac{1}{x} \right)^{x^2}$$

$$39. \lim_{x \rightarrow 1} \frac{x - 1 + \ln x}{x^2 - 3x + 2}$$

$$40. \lim_{x \rightarrow \pi/2} \frac{\cos x}{\sqrt{1 - \sin x}}$$

$$41. \lim_{h \rightarrow 0} \frac{\operatorname{tg}(a+h) - \operatorname{tga}}{h}$$

$$42. \lim_{x \rightarrow -1} \frac{\operatorname{sen}(x+1)}{x^2 + 2x + 1}$$

$$43. \lim_{x \rightarrow +\infty} \left(\sqrt{x(x+1)} - x \right)$$

$$44. \lim_{x \rightarrow \infty} \frac{2 + 3^x}{3 + 2^x}$$

$$45. \lim_{x \rightarrow \infty} \frac{(x+1)^2}{x^2 + 1}$$

$$46. \lim_{x \rightarrow \infty} \frac{1000x}{x^2 - 1}$$

$$47. \lim_{x \rightarrow +\infty} \frac{x^2 - 5x + 1}{3x + 7}$$

$$49. \lim_{x \rightarrow +\infty} \frac{(2x+3)^3(3x-2)^2}{x^5 + 5}$$

$$51. \lim_{x \rightarrow \infty} \frac{2x+3}{x + \sqrt[3]{x}}$$

$$53. \lim_{x \rightarrow 1} \operatorname{ctg}(2x) \operatorname{ctg}\left(\frac{\pi}{2} - x\right)$$

$$55. f(x) = \begin{cases} 2x-1 & \text{si } x < 4 \\ 7 & \text{si } x \geq 4 \end{cases}$$

$$\lim_{x \rightarrow 1} f(x) = ? \quad \lim_{x \rightarrow 5} f(x) = ?$$

$$56. f(x) = \begin{cases} \operatorname{sen}(2\pi x) & \text{si } x < 0 \\ \log_3(2x+1) & \text{si } 0 < x \leq 1 \\ 2 & \text{si } x > 1 \end{cases}$$

$$\lim_{x \rightarrow 0} f(x) = ? \quad \lim_{x \rightarrow 1} f(x) = ?$$

$$48. \lim_{x \rightarrow +\infty} \frac{2x^2 - x + 3}{x^3 - 8x + 5}$$

$$50. \lim_{x \rightarrow \infty} \frac{2x^2 - 3x - 4}{\sqrt{x^4 + 1}}$$

$$52. \lim_{x \rightarrow +\infty} \frac{x^2}{10 + x\sqrt{x}}$$

$$54. \lim_{x \rightarrow \infty} \frac{\sqrt[3]{x^2 + 1}}{x + 1}$$