

LIMITES

Comprueba los siguientes límites:

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

3.- $\lim_{x \rightarrow 0} \frac{1}{x} - \frac{1}{\ln(x+1)} = -\frac{1}{2}$

5.- $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$

7.- $\lim_{x \rightarrow 0} \operatorname{cosec} x - \frac{1}{x} = 0$

9.- $\lim_{x \rightarrow \mathbf{p}/2} \frac{\operatorname{tg} x - 3}{\operatorname{sec} x + 1} = 1$

11.- $\lim_{x \rightarrow 0} \frac{e^x - e^{\operatorname{sen} x}}{x^3} = \frac{1}{6}$

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

15.- $\lim_{x \rightarrow \mathbf{p}/2} \frac{\operatorname{tg} 3x}{\operatorname{tg} 5x} = \frac{5}{3}$

17.- $\lim_{x \rightarrow 0} (\operatorname{sen} x)^x = 1$

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

21.- $\lim_{x \rightarrow 0^+} [x (\ln x)^n] = 0$

23.- $\lim_{x \rightarrow 0} (\operatorname{sen} x + \operatorname{cos} x)^{\operatorname{cot} x} = e$

25.- $\lim_{x \rightarrow \infty} \frac{\ln x}{\sqrt{x}} = 0$

47.- $\lim_{x \rightarrow \infty} \frac{\ln x}{x} = 0$

6 $\lim_{x \rightarrow 0} x^x = 1$ $\lim_{x \rightarrow 0} \left(\frac{1}{x} \right)^{\operatorname{tg} x} = 1$

2.- $\lim_{x \rightarrow \mathbf{1}^+} (x^2 - 1) \operatorname{tg} \left(\frac{\mathbf{p}}{2} x \right) = \frac{-4}{\mathbf{p}}$

4.- $\lim_{x \rightarrow 0} \frac{\ln x}{\operatorname{cot} g x} = 0$

6.- $\lim_{x \rightarrow 0} \frac{1 - \operatorname{cos} x}{3x^2} = \frac{1}{6}$

8.- $\lim_{x \rightarrow 1} \frac{\operatorname{sen}(x - 1)}{x^2 - 3x + 2} = -1$

10.- $\lim_{x \rightarrow 3} \left(\frac{2}{x-3} - \frac{12}{x^2-9} \right) = \frac{1}{3}$

12.- $\lim_{x \rightarrow \mathbf{p}/2} (\operatorname{sen} x)^{\operatorname{tg} x} = 1$

14.- $\lim_{x \rightarrow \frac{\mathbf{p}}{2}} (1 + 2 \operatorname{cos} x)^{\frac{1}{\operatorname{cos} x}} = e^2$

16.- $\lim_{x \rightarrow 0} \frac{e^x - e^{-x} - 2x}{x - \operatorname{sen} x} = 2$

18.- $\lim_{x \rightarrow 0^+} (\operatorname{tg} x \cdot \ln x) = 0$

20.- $\lim_{x \rightarrow 0} \left(\frac{1}{x} - \frac{1}{\operatorname{sen} x} \right) = 0$

22.- $\lim_{x \rightarrow \infty} \frac{\ln^4 x}{x^2} + 1 = 1$

14.- $\lim_{x \rightarrow \infty} \left(x \ln \frac{1+x}{x} \right) = 1$

36.- $\lim_{x \rightarrow 0} \frac{1 - \operatorname{cos} x}{(e^x - 1)^2} = \frac{1}{2}$

58.- $\lim_{x \rightarrow \infty} x (5^{\frac{1}{x}} - 1) = \ln 5$

8.- $\lim_{x \rightarrow 1} \frac{1}{x^{\frac{1}{1-x}}} = \frac{1}{e}$

$$9.- \lim_{x \rightarrow 1} \left(\frac{x}{x-1} - \frac{1}{\ln x} \right) = \frac{1}{2}$$

$$11.- \lim_{x \rightarrow \pi/4} \operatorname{tg} x^{\frac{1}{\cos 2x}} = \frac{1}{e}$$

$$13.- \lim_{x \rightarrow \infty} (x^2 + 1)^{\frac{1}{x}} = 1$$

$$15.- \lim_{x \rightarrow 0} \frac{x \cos x - \operatorname{sen} x}{x^3} = -\frac{1}{3}$$

$$17.- \lim_{x \rightarrow \infty} \left(1 + \frac{5}{x} \right)^{7x} = e^{35}$$

$$19.- \lim_{x \rightarrow \infty} (\ln x)^{\frac{1}{x^2}} = 1$$

$$21.- \lim_{x \rightarrow 0} \frac{x - \operatorname{sen} x}{\operatorname{tg} x - \operatorname{sen} x} = \frac{1}{3}$$

$$23.- \lim_{x \rightarrow 0} \frac{x^3 \operatorname{sen} x}{(1 - \cos x)^2} = 4$$

$$25.- \lim_{x \rightarrow 0} \ln x \operatorname{tg} x = 0$$

$$27.- \lim_{x \rightarrow 0} \left(\frac{1}{\operatorname{sen}^2 x} - \frac{1}{x^2} \right) = \frac{1}{3}$$

$$29.- \lim_{x \rightarrow 0} \frac{\operatorname{tg} x - \operatorname{sen} x}{x^3} = \frac{1}{2}$$

$$31.- \lim_{x \rightarrow 0} \frac{1 - \cos^2 x}{(\operatorname{sen} x + \operatorname{tg} x)^2} = \frac{1}{4}$$

$$33.- \lim_{x \rightarrow 0} \frac{\operatorname{arctg} x - x}{x - \operatorname{sen} x} = -2$$

$$35.- \lim_{x \rightarrow 0} \frac{\operatorname{tg} x - x}{x - \operatorname{sen} x} = -1$$

$$37.- \lim_{x \rightarrow 0} (1 - \cos x)^{\operatorname{tg} x} = 1$$

$$39.- \lim_{x \rightarrow 0} x \cdot \ln x = 0$$

$$41.- \lim_{x \rightarrow 0} \left(\frac{1}{x} - \frac{1}{e^x - 1} \right) = \frac{1}{2}$$

$$43.- \lim_{x \rightarrow 1} \frac{2x - 2}{(26 + x)^{1/3} - 3} = 54$$

$$10.- \lim_{x \rightarrow \pi/2} \cos x \ln(\operatorname{tg} x) = 0$$

$$12.- \lim_{x \rightarrow 0^+} x^2 \ln x = 0$$

$$14.- \lim_{x \rightarrow \infty} \frac{3^x}{x^3} = \infty$$

$$16.- \lim_{x \rightarrow \infty} (\ln x)^{\frac{1}{x}} = 1$$

$$18.- \lim_{x \rightarrow 1^+} (x-1) \ln(x-1) = 0$$

$$20.- \lim_{x \rightarrow 0} \frac{\cos x - 2x^2 - 1}{3x^2} = -\frac{5}{6}$$

$$22.- \lim_{x \rightarrow 0} \frac{x}{x + \operatorname{sen} x} = \frac{1}{2}$$

$$24.- \lim_{x \rightarrow 0} \frac{\operatorname{sen} x}{\operatorname{tg} x} = 1$$

$$26.- \lim_{x \rightarrow \infty} \frac{\ln x}{\sqrt[3]{x}} = 0$$

$$28.- \lim_{x \rightarrow \infty} x \operatorname{sen} \frac{a}{x} = a$$

$$30.- \lim_{x \rightarrow 0} (\cos x)^{\operatorname{cotg}^2 x} = e^{-\frac{1}{2}}$$

$$32.- \lim_{x \rightarrow 0} \frac{x - \operatorname{sen} 2x}{x + \operatorname{sen} 3x} = -\frac{1}{4}$$

$$34.- \lim_{x \rightarrow 0} \frac{\operatorname{arctg} x - x - \frac{x^3}{3}}{x^3} = -\frac{2}{3}$$

$$36.- \lim_{x \rightarrow 0} \left(\frac{a^x + b^x}{2} \right)^{\frac{1}{x}} = a \cdot b$$

$$38.- \lim_{x \rightarrow 0^+} \frac{\ln x}{\operatorname{cosec} x} = 0$$

$$40.- \lim_{x \rightarrow 1} \left(\frac{1}{\ln x} - \frac{1}{x-1} \right) = \frac{1}{2}$$

$$42.- \lim_{x \rightarrow -1} \frac{x+1}{\sqrt{6x^2+3} + 3x} = 1$$

$$44.- \lim_{x \rightarrow -1} \frac{1+x^{1/3}}{1+x^{1/5}} = \frac{5}{3}$$

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$$45.- \lim_{x \rightarrow 0} (1 + x)^{\frac{1}{x}} = e$$

$$47.- \lim_{x \rightarrow 0} \left(\frac{1}{x} - \frac{1}{\ln(x+1)} \right) = -\frac{1}{2}$$

$$49.- \lim_{x \rightarrow 1} \left(\operatorname{tg} \left(\frac{\mathbf{p}}{4} x \right) \right)^{\operatorname{tg} \left(\frac{\mathbf{p}}{2} x \right)} = \frac{1}{e}$$

$$51.- \lim_{x \rightarrow \infty} x^{\operatorname{sen} \frac{1}{x}} = 1$$

$$53.- \lim_{x \rightarrow \infty} x \ln \left(\frac{x-a}{x+a} \right) = -2a$$

$$55.- \lim_{x \rightarrow 0} \frac{(2-x)e^x - (2+x)}{x^2} = 0$$

$$57.- \lim_{x \rightarrow \infty} (x + e^x + e^{2x})^{\frac{1}{x}} = e^2$$

$$59.- \lim_{x \rightarrow 0} (1 + \operatorname{sen} x)^{\operatorname{cosec}(x/2)} = e^2$$

$$61.- \lim_{x \rightarrow \infty} (1 - e^{-x})^x = \frac{1}{e}$$

$$63.- \lim_{x \rightarrow 0} \frac{x - \operatorname{sen} 2x}{x + \operatorname{sen} 4x} = -\frac{1}{5}$$

$$65.- \lim_{x \rightarrow 0} (1 - \operatorname{sen} 2x)^{\operatorname{cotg} x} = 1$$

$$46.- \lim_{x \rightarrow 0} (1 - \cos x)^{2x} = 1$$

$$48.- \lim_{x \rightarrow 0} x^{\operatorname{sen} x} = 1$$

$$50.- \lim_{x \rightarrow \frac{\mathbf{p}}{2}} \left(\operatorname{tg} \frac{x}{2} \right)^{\frac{1}{x-\mathbf{p}/2}} = 1$$

$$52.- \lim_{x \rightarrow \frac{\mathbf{p}}{2}} (1 - \cos x)^{\operatorname{tg} x} = \frac{1}{e}$$

$$54.- \lim_{x \rightarrow 1} (1-x) \operatorname{tg} \frac{\mathbf{p}x}{2} = \frac{2}{\mathbf{p}}$$

$$56.- \lim_{x \rightarrow 0} x \cdot \operatorname{sen} \frac{1}{x} = 0$$

$$58.- \lim_{x \rightarrow \mathbf{p}} (x - \mathbf{p}) \operatorname{tg} \left(\frac{x}{2} \right) = -2$$

$$60.- \lim_{x \rightarrow 0} (\operatorname{cotg} x)^x = 1$$

$$62.- \lim_{x \rightarrow 0} (\operatorname{sen} x)^{\operatorname{tg} x} = 1$$

$$64.- \lim_{x \rightarrow \mathbf{p}} \frac{\operatorname{tg} x - x}{x - \operatorname{sen} x} = 0$$

$$66.- \lim_{x \rightarrow 0} \frac{x - \operatorname{sen} x}{x^3} = \frac{1}{6}$$