



TALLER DE LÍMITES

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I. Resolver los siguientes límites algebraicos.

1. $\lim_{x \rightarrow 1} 4$

2. $\lim_{x \rightarrow -1} 2x$

3. $\lim_{x \rightarrow -3} -3x$

4. $\lim_{x \rightarrow 0} 4 \cdot x^2$

5. $\lim_{x \rightarrow 3} -6 \cdot x^6$

6. $\lim_{x \rightarrow 3} -\frac{5}{8} \cdot x^4$

7. $\lim_{x \rightarrow -2} 6\sqrt{2} \cdot x^5$

8. $\lim_{x \rightarrow 1} 4x^3$

9. $\lim_{x \rightarrow -1} (4x^3 + x^2 + 2x + 1)$

10. $\lim_{x \rightarrow 5} (2x^3 - 3x^2 - x - 4)$

11. $\lim_{x \rightarrow -3} (x^3 + x^2 + 2x + 6)$

12. $\lim_{x \rightarrow 2} (5x^3 - x^2 - 3)$

13. $\lim_{x \rightarrow -1} (2x^3 + x + 7)$

20. $\lim_{x \rightarrow 0} (x^4 + 3x^3 - 4x^2 + x - 6)$

21. $\lim_{x \rightarrow 1} (3x^4 - 2x^2 + 10)$

22. $\lim_{x \rightarrow 4} (5x^4 - 2x + 6)$

23. $\lim_{x \rightarrow -3} (x^4 + 2x^3 + 5x^2 - 3x + 4)$

24. $\lim_{x \rightarrow 2} (3x^4 - 4x^3 + 5)$

25. $\lim_{x \rightarrow 2} (x^3 - x + 1) \cdot (2x^3 - 5)$

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

27. $\lim_{x \rightarrow -3} (4x^3 - 2x) \cdot (x^3 + x^2 + 1)$

28. $\lim_{x \rightarrow 3} (x^3 - 4)(2x^2 - 1)$

29. $\lim_{x \rightarrow 1} (3x^4 + 2x^2 - 1)(x^3 - 2)$

30. $\lim_{x \rightarrow -5} (x^4 - 3x)(x^3 + 4x^2 - 1)$

31. $\lim_{x \rightarrow -2} (3x^4 + x^2)(x^2 + 1)$

32. $\lim_{x \rightarrow 4} (x^2 + 2x + 3)(x + 1)$

$$\lim_{X \rightarrow 1} 4 = 4$$

$$\begin{aligned} \lim_{X \rightarrow 3} -6X^6 &= -6 \cdot \lim_{X \rightarrow 3} X^6 = -6 \cdot (\lim_{X \rightarrow 3} X)^6 = -6 \cdot (3)^6 = -6 \cdot 729 \\ &= -4374 \end{aligned}$$

$$\lim_{X \rightarrow a} X = a$$



$$\lim_{X \rightarrow 1} 4X^3$$

$$\lim_{X \rightarrow 1} 4X^3$$

$$\lim_{X \rightarrow 1} 4X^3 = 4 \cdot (\lim_{X \rightarrow 1} X^3) = 4 \cdot (\lim_{X \rightarrow 1} X)^3 = 4 \cdot (1)^3 = 4$$

$$\lim_{X \rightarrow 1} 4X^3 = \lim_{X \rightarrow 1} 4(1)^3 = 4$$

$$\lim_{X \rightarrow 1} 3X^4 - 2X^2 + 10$$

$$\lim_{X \rightarrow 1} 3X^4 - \lim_{X \rightarrow 1} 2X^2 + \lim_{X \rightarrow 1} 10$$

$$3 \cdot (\lim_{X \rightarrow 1} X)^4 - 2 \cdot (\lim_{X \rightarrow 1} X)^2 + \lim_{X \rightarrow 1} 10$$

$$3 \cdot (1)^4 - 2 \cdot (1)^2 + 10 = 3 - 2 + 10 = 11$$

$$\lim_{X \rightarrow 4} 5X^4 - 2X + 6$$

$$\lim_{x \rightarrow 4} 5x^4 - 2x + 6$$

$$\lim_{x \rightarrow 4} 5x^4 - \lim_{x \rightarrow 4} 2x + \lim_{x \rightarrow 4} 6$$

$$5(\lim_{x \rightarrow 4} x^4) - 2(\lim_{x \rightarrow 4} x) + 6$$

$$5(4)^4 - 2(4) + 6$$

$$5(256) - 8 + 6$$

$$1280 - 8 + 6$$

$$= 1278$$

$$\lim_{X \rightarrow 2} (X^3 - X + 1)(2X^3 - 5)$$

$$\lim_{X \rightarrow 2} (X^3 - X + 1) \cdot \lim_{X \rightarrow 2} (2X^3 - 5)$$

$$\left[(\lim_{X \rightarrow 2} X)^3 - \lim_{X \rightarrow 2} X + \lim_{X \rightarrow 2} 1 \right] \cdot \left[2 \cdot (\lim_{X \rightarrow 2} X)^3 - \lim_{X \rightarrow 2} 5 \right]$$

$$[(2)^3 - 2 + 1] \cdot [2 \cdot (2)^3 - 5]$$

$$[8 - 2 + 1] \cdot [16 - 5]$$

$$[7] \cdot [11] = 77$$

$$28. \lim_{x \rightarrow 3} (x^3 - 4)(2x^2 - 1)$$

$$\left[\lim_{x \rightarrow 3} x^3 - \lim_{x \rightarrow 3} 4 \right] \cdot \left[2 \cdot \lim_{x \rightarrow 3} x^2 - \lim_{x \rightarrow 3} 1 \right]$$

$$\left[(3)^3 - 4 \right] \cdot \left[2(3)^2 - 1 \right]$$

$$\left[27 - 4 \right] \cdot \left[2(9) - 1 \right]$$

$$\left[23 \right] \cdot \left[18 - 1 \right]$$

$$\left[23 \right] \cdot \left[17 \right]$$

$$\lim_{x \rightarrow 3} = 391$$

$$\lim_{x \rightarrow 2} \left(\frac{x^3 + 2x + 3}{x^2 + 5} \right)$$

$$\frac{\lim_{X \rightarrow 2} (X^3 + 2X + 3)}{\lim_{X \rightarrow 2} (X^2 + 5)} = \frac{\lim_{X \rightarrow 2} X^3 + 2 \cdot \lim_{X \rightarrow 2} X + \lim_{X \rightarrow 2} 3}{\lim_{X \rightarrow 2} X^2 + \lim_{X \rightarrow 2} 5}$$

$$\frac{(\lim_{X \rightarrow 2} X)^3 + 2 \cdot \lim_{X \rightarrow 2} X + \lim_{X \rightarrow 2} 3}{(\lim_{X \rightarrow 2} X)^2 + \lim_{X \rightarrow 2} 5} = \frac{(2)^3 + 2 \cdot (2) + 3}{(2)^2 + 5} = \frac{8 + 4 + 3}{4 + 5} = \frac{15}{9} = \frac{5}{3}$$

$$\lim_{x \rightarrow -2} \left(\frac{x^3 - x^2 - x + 10}{x^2 + 3x - 2} \right)$$

$$\frac{(\lim_{X \rightarrow -2} X)^3 - (\lim_{X \rightarrow -2} X)^2 - \lim_{X \rightarrow -2} X + \lim_{X \rightarrow -2} 10}{(\lim_{X \rightarrow -2} X)^2 + 3 \cdot \lim_{X \rightarrow -2} X - \lim_{X \rightarrow -2} 2} =$$

$$\frac{(-2)^3 - (-2)^2 - (-2) + 10}{(-2)^2 + 3 \cdot (-2) - 2} = \frac{-8 - 4 + 2 + 10}{4 - 6 - 2} = \frac{0}{-4} = 0$$

$$\begin{aligned} -2^3 &= (-2)^3 \\ -8 &= -8 \end{aligned}$$

$$\begin{aligned} -2^4 &= (-2)^4 \\ -16 &= 16 \end{aligned}$$

$$\lim_{x \rightarrow -1} \frac{x^2 + 2x - 3}{x^2 + 5x + 4}$$

$$\lim_{x \rightarrow -1} \frac{(x + 3)(x - 1)}{(x + 4)(x + 1)} = \text{INDETERMINACIÓN}$$

$$\lim_{x \rightarrow -1} \frac{x^2 - 2x - 3}{x^2 + 5x + 4}$$

$$\lim_{x \rightarrow -1} \frac{(x - 3)(x + 1)}{(x + 4)(x + 1)} = \lim_{x \rightarrow -1} \frac{x - 3}{x + 4} = \frac{-4}{3}$$