Cálculo Diferencial: Ejercicios de Límites

Carlos Ernesto Martinez

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1. Resolver los siguientes limites

(a)
$$\lim_{x\to 2} \frac{x^2-1}{x-1}$$

(d)
$$\lim_{x\to 0} \frac{2x^2+3x}{x}$$

(g)
$$\lim_{x \to -2} \frac{3x+4}{x+2}$$

(b)
$$\lim_{x \to -3} \frac{2x+5}{x+3}$$

(e)
$$\lim_{x\to -1} \frac{x^3-1}{x^2-1}$$

(h)
$$\lim_{x\to 2} \frac{x^3 - 2x^2 - x + 2}{x - 2}$$

(c)
$$\lim_{x\to 1} \frac{3x^2-4x-3}{x-1}$$

(f)
$$\lim_{x\to 3} \frac{x^2+2x-3}{x-3}$$

(i)
$$\lim_{x\to -4} \frac{2x^2-9x-5}{x+4}$$

2. Resolver los siguientes limites

(a)
$$\lim_{x\to 3} \frac{x}{x-3}$$

(d)
$$\lim_{x \to -1} \frac{x^3}{x+1}$$

(g)
$$\lim_{x\to 4} \frac{x^2}{x-4}$$

(b)
$$\lim_{x \to -2} \frac{x^2}{x+2}$$

(e)
$$\lim_{x\to 5} \frac{4x}{x-5}$$

(h)
$$\lim_{x\to 2} \frac{3x}{x-2}$$

(c)
$$\lim_{x\to 1} \frac{2x}{x-1}$$

(f)
$$\lim_{x\to 0} \frac{x}{x-0}$$

(i)
$$\lim_{x \to -3} \frac{x^3}{x+3}$$

3. Resolver los siguientes limites

(a)
$$\lim_{x \to -2} \frac{3x}{4-x^2}$$

(d)
$$\lim_{x \to -1} \frac{5x}{4-x^2}$$

(g)
$$\lim_{x\to -1} \frac{2x}{x^2-9}$$

(b)
$$\lim_{x \to 1} \frac{x}{5-x^2}$$

(e)
$$\lim_{x \to 2} \frac{x}{x^2 - 5}$$

(h)
$$\lim_{x\to 0} \frac{3x}{x^2+1}$$

(c)
$$\lim_{x\to 0} \frac{2x}{3-x^2}$$

(f)
$$\lim_{x\to 3} \frac{4x}{5-x^2}$$

(i)
$$\lim_{x \to -1} \frac{6x}{x^2 - 4}$$

4. Resolver los siguientes limites

(a)
$$\lim_{x \to -1} \frac{x+3}{x^2-1}$$

(d)
$$\lim_{x\to 2} \frac{x+5}{x^2-4}$$

(g)
$$\lim_{x\to 3} \frac{x+2}{x^2-9}$$

(b)
$$\lim_{x\to 2} \frac{x+4}{x^2-4}$$

(e)
$$\lim_{x\to 6} \frac{x+6}{x^2-36}$$

(h)
$$\lim_{x\to 8} \frac{x+5}{x^2-64}$$

(c)
$$\lim_{x\to 4} \frac{x+1}{x^2-16}$$

(f)
$$\lim_{x\to 5} \frac{x+4}{x^2-25}$$

(i)
$$\lim_{x\to 9} \frac{x+6}{x^2-81}$$

5. Resolver los siguientes limites

(a)
$$\lim_{x\to 2} \frac{\sqrt{4+x^2}}{x}$$

(d)
$$\lim_{x \to -1} \frac{\sqrt{2+x^2}}{x}$$

(g)
$$\lim_{x\to 1} \frac{\sqrt{1+x^2}}{x}$$

(b)
$$\lim_{x\to 1} \frac{\sqrt{1+x^2}}{x}$$

(e)
$$\lim_{x \to 4} \frac{\sqrt{5+x^2}}{x}$$

(h)
$$\lim_{x\to 0} \frac{\sqrt{16+x^2}}{x}$$

(c)
$$\lim_{x\to 0} \frac{\sqrt{3+x^2}}{x}$$

(f)
$$\lim_{x\to 3} \frac{\sqrt{9+x^2}}{x}$$

(i)
$$\lim_{x \to -2} \frac{\sqrt{4+x^2}}{x}$$

6. Resolver los siguientes limites

(a)
$$\lim_{x\to 2} \frac{\sqrt{x^2-4}}{x-2}$$

(c)
$$\lim_{x\to 1} \frac{\sqrt{x^2-1}}{x-1}$$

(e)
$$\lim_{x\to -2} \frac{\sqrt{x^2-4}}{x+2}$$

(b)
$$\lim_{x\to 4} \frac{\sqrt{x^2-16}}{x-4}$$

(d)
$$\lim_{x\to 5} \frac{\sqrt{x^2-25}}{x-5}$$

1

(f)
$$\lim_{x\to 3} \frac{\sqrt{x^2-9}}{x-3}$$

(g)
$$\lim_{x\to 4} \frac{\sqrt{x^2-16}}{x-4}$$

(h)
$$\lim_{x\to 1} \frac{\sqrt{x^2-1}}{x-1}$$

(i)
$$\lim_{x\to 5} \frac{\sqrt{x^2-25}}{x-5}$$

7. Resolver los siguientes limites

(a)
$$\lim_{x\to 0} \left(\frac{1}{x^2} - \frac{1}{x^3}\right)$$

(d)
$$\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{x^4}\right)$$

(g)
$$\lim_{x\to 0} \left(\frac{1}{x^2} - \frac{1}{x^4}\right)$$

(b)
$$\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{x^3}\right)$$

(e)
$$\lim_{x\to 0} \left(\frac{1}{x^3} - \frac{1}{x^4}\right)$$

(h)
$$\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{x^4}\right)$$

(c)
$$\lim_{x\to 0} \left(\frac{1}{x^2} - \frac{1}{x^4}\right)$$

(f)
$$\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{x^2}\right)$$

(i)
$$\lim_{x\to 0} \left(\frac{1}{x^3} - \frac{1}{x^4}\right)$$

8. Resolver los siguientes limites

(a)
$$\lim_{x\to 0} \frac{3x^2 - 2x^3}{4x^3 + x^2}$$

(d)
$$\lim_{x\to 0} \frac{6x^3 - 5x^4}{x^2 - 3x^5}$$

(g)
$$\lim_{x\to 0} \frac{x^4 - 4x^5}{5x^6 - 2x^3}$$

(b)
$$\lim_{x\to 0} \frac{x^3 - 2x^2}{3x^4 - 5x^2}$$

(e)
$$\lim_{x\to 0} \frac{x^3 - 6x^4}{2x^5 + 4x^2}$$

(h)
$$\lim_{x\to 0} \frac{6x^3 - 5x^4}{x^2 - 3x^6}$$

(c)
$$\lim_{x\to 0} \frac{x^4-4x^3}{5x^5-2x^2}$$

(f)
$$\lim_{x\to 0} \frac{x^3-2x^4}{3x^5-5x^2}$$

(i)
$$\lim_{x\to 0} \frac{x^4-6x^5}{2x^6+4x^3}$$

9. Resolver los siguientes limites

(a)
$$\lim_{x\to 2} \left(\frac{1}{x} - \frac{3}{x^2-4}\right)$$

(d)
$$\lim_{x\to -2} \left(\frac{1}{x+2} - \frac{2}{x^2-1}\right)$$

(g)
$$\lim_{x\to 2} \left(\frac{5}{x-2} - \frac{2}{x^2-1} \right)$$

(b)
$$\lim_{x\to 3} \left(\frac{2}{x+1} - \frac{4}{x^2-9} \right)$$

(e)
$$\lim_{x\to -1} \left(\frac{4}{x+1} - \frac{1}{x^2-4} \right)$$

(b)
$$\lim_{x\to 3} \left(\frac{2}{x+1} - \frac{4}{x^2-9}\right)$$
 (e) $\lim_{x\to -1} \left(\frac{4}{x+1} - \frac{1}{x^2-4}\right)$ (h) $\lim_{x\to -2} \left(\frac{1}{x+2} - \frac{2}{x^2-1}\right)$

(c)
$$\lim_{x\to 1} \left(\frac{5}{x-2} - \frac{2}{x^2-1} \right)$$

(f)
$$\lim_{x\to -3} \left(\frac{2}{x+1} - \frac{4}{x^2-9}\right)$$

(f)
$$\lim_{x\to -3} \left(\frac{2}{x+1} - \frac{4}{x^2-9}\right)$$
 (i) $\lim_{x\to -1} \left(\frac{4}{x+1} - \frac{1}{x^2-4}\right)$

10. Resolver los siguientes limites

(a)
$$\lim_{x\to 1} \frac{x^3 + 5x^2 + 6x}{x^2 - 3x + 2}$$

(d)
$$\lim_{x\to 2} \frac{x^3 + 10x^2 + 25x}{x^2 - 5x + 6}$$

(g)
$$\lim_{x\to -3} \frac{x^3+4x^2+3x}{x^2-2x-15}$$

(b)
$$\lim_{x\to 3} \frac{x^3 + 8x^2 + 12x}{x^2 - 4x + 3}$$

(e)
$$\lim_{x\to 1} \frac{x^3 + 7x^2 + 10x}{x^2 - 3x + 2}$$

(h)
$$\lim_{x\to 2} \frac{x^3+10x^2+25x}{x^2-5x+6}$$

(c)
$$\lim_{x\to 5} \frac{x^3+4x^2+3x}{x^2-2x-15}$$

(f)
$$\lim_{x\to 3} \frac{x^3 + 8x^2 + 12x}{x^2 - 4x + 3}$$

(i)
$$\lim_{x\to 2} \frac{x^3 + 7x^2 + 10x}{x^2 - 3x + 2}$$

11. Resolver los siguientes lìmites

(a)
$$\lim_{x \to -5} \frac{3}{x^2 + 7x + 10}$$

(d)
$$\lim_{x\to 3} \frac{6}{x^2-0x+21}$$

(g)
$$\lim_{x\to 9} \frac{2}{x^2+8x-9}$$

(b)
$$\lim_{x\to 3} \frac{2}{x^2-6x+9}$$

(e)
$$\lim_{x\to -5} \frac{7}{x^2+5x}$$

(h)
$$\lim_{x\to 3} \frac{6}{x^2+8x-15}$$

(c)
$$\lim_{x \to -4} \frac{4}{x^2 + 9x + 20}$$

(f)
$$\lim_{x\to 3} \frac{4}{x^2+4x-21}$$

(i)
$$\lim_{x\to 0} \frac{7}{x^2+3x}$$

12. Resolver los siguientes limites

(a)
$$\lim_{x \to 4} \frac{\sqrt{x} - 3}{x - 4}$$

(d)
$$\lim_{x\to 1} \frac{\sqrt{x+1}}{x^2-1}$$

(g)
$$\lim_{x\to 4} \frac{\sqrt{x}-2}{x^2-16}$$

(b)
$$\lim_{x\to 2} \frac{\sqrt{x}-2}{x-4}$$

(e)
$$\lim_{x\to 4} \frac{\sqrt{x}+2}{x^3-64}$$

(h)
$$\lim_{x\to 4} \frac{\sqrt{x+1}}{x^2-12x+32}$$

(c)
$$\lim_{x\to 4} \frac{\sqrt{x}-2}{x^2-16}$$

(f)
$$\lim_{x\to 4} \frac{\sqrt{x}-2}{x-4}$$

(i)
$$\lim_{x\to 4} \frac{\sqrt{x+2}}{x^2-64}$$

13. Resolver los siguientes limites

(a)
$$\lim_{x\to -2} \frac{x^2+6x+9}{x+2}$$

(c)
$$\lim_{x\to -1} \frac{x^2+5x+6}{x+1}$$

(e)
$$\lim_{x\to -2} \frac{x^2+7x+12}{x+2}$$

(b)
$$\lim_{x\to 1} \frac{x^2+3x+2}{x-1}$$

(d)
$$\lim_{x\to -4} \frac{x^2+2x+1}{x+4}$$

(f)
$$\lim_{x\to 1} \frac{x^2+3x+2}{x-1}$$

(g)
$$\lim_{x\to -1} \frac{x^2+5x+6}{x+1}$$

(h)
$$\lim_{x\to -4} \frac{x^2+2x+1}{x+4}$$

(i)
$$\lim_{x\to -2} \frac{x^2+7x+12}{x+2}$$

14. Resolver los siguientes lìmites

(a)
$$\lim_{x\to 16} \frac{x-11}{\sqrt{x}-4}$$

(d)
$$\lim_{x\to 1} \frac{x-7}{\sqrt{x}+4}$$

(g)
$$\lim_{x\to 1} \frac{x-10}{\sqrt{x}+1}$$

(b)
$$\lim_{x\to 4} \frac{x-8}{\sqrt{x}-2}$$

(e)
$$\lim_{x\to 25} \frac{x-12}{\sqrt{x}-5}$$

(h)
$$\lim_{x\to 9} \frac{x-7}{\sqrt{x}+4}$$

(c)
$$\lim_{x\to 1} \frac{x-10}{\sqrt{x}+1}$$

(f)
$$\lim_{x\to 4} \frac{x-8}{\sqrt{x}-2}$$

(i)
$$\lim_{x\to 25} \frac{x-12}{\sqrt{x}-5}$$

15. Resolver los siguientes limites

(a)
$$\lim_{x\to 5} \frac{x-4}{\sqrt{x-4}-1}$$

(d)
$$\lim_{x\to 23} \frac{x-7}{\sqrt{x-7}-4}$$

(g)
$$\lim_{x\to 3} \frac{x-3}{\sqrt{x-3}}$$

(b)
$$\lim_{x\to 15} \frac{x-6}{\sqrt{x-6}-3}$$

(e)
$$\lim_{x\to 4} \frac{x-2}{\sqrt{x-2}-1}$$

(h)
$$\lim_{x\to 23} \frac{x-7}{\sqrt{x-7}-4}$$

(c)
$$\lim_{x\to 3} \frac{x-3}{\sqrt{x-3}}$$

(f)
$$\lim_{x\to 15} \frac{x-6}{\sqrt{x-6}-3}$$

(i)
$$\lim_{x\to 3} \frac{x-2}{\sqrt{x-2}-1}$$

16. Resolver los siguientes limites

(a)
$$\lim_{x\to 1} \frac{\sqrt{x+5}-2}{x-1}$$

(d)
$$\lim_{x\to 7} \frac{\sqrt{x+6}-1}{x-7}$$

(g)
$$\lim_{x\to 12} \frac{\sqrt{x+2}-5}{x-12}$$

(b)
$$\lim_{x\to 2} \frac{\sqrt{x+3}-4}{x-2}$$

(e)
$$\lim_{x\to 4} \frac{\sqrt{x+1}-6}{x-4}$$

(h)
$$\lim_{x\to 3} \frac{\sqrt{x+6}-1}{x-3}$$

(c)
$$\lim_{x\to 11} \frac{\sqrt{x+2}-5}{x-11}$$

(f)
$$\lim_{x\to 6} \frac{\sqrt{x+3}-4}{x-6}$$

(i)
$$\lim_{x\to 5} \frac{\sqrt{x+1}-6}{x-5}$$

17. Resolver los siguientes limites

(a)
$$\lim_{x\to 5} \frac{x+2}{x-1}$$

(d)
$$\lim_{x\to 0} \frac{2x^2+3x}{x}$$

(h)
$$\lim_{x\to 2} \frac{4x^2-5x-6}{x-2}$$

(b)
$$\lim_{x \to -3} \frac{2x+5}{x+3}$$

(e)
$$\lim_{x \to -1} \frac{x^3 - 1}{x^2 - 1}$$

(f) $\lim_{x \to 2} \frac{x^2 + 2x - 3}{x - 2}$

(i)
$$\lim_{x\to 0} \frac{5x^2+6x}{x}$$

(c)
$$\lim_{x\to 1} \frac{3x^2-4x-3}{x-1}$$

(g)
$$\lim_{x \to -4} \frac{3x+4}{x+4}$$

(j)
$$\lim_{x\to 1} \frac{x^3 - 3x^2 + 2x}{x - 1}$$