

Ejercicios de límite resueltos paso a paso

$$\begin{aligned}
 1. \quad \lim_{x \rightarrow -8} \frac{x^2 - 64}{x + 8} &= \lim_{x \rightarrow -8} \frac{(x-8)(x+8)}{x+8} \\
 &= \lim_{x \rightarrow -8} \frac{(x-8)\cancel{(x+8)}}{\cancel{x+8}} \\
 &= \lim_{x \rightarrow -8} x - 8 \\
 &= -8 - 8 \\
 &= -16
 \end{aligned}$$

$$\begin{aligned}
 2. \quad \lim_{x \rightarrow 9} \frac{x^2 - 81}{x - 9} &= \lim_{x \rightarrow 9} \frac{(x-9)(x+9)}{x-9} \\
 &= \lim_{x \rightarrow 9} \frac{\cancel{(x-9)}(x+9)}{\cancel{x-9}} \\
 &= \lim_{x \rightarrow 9} x + 9 \\
 &= 9 + 9 \\
 &= 18
 \end{aligned}$$

$$\begin{aligned}
 3. \quad \lim_{x \rightarrow -1} \frac{x^2 + 1}{x + 1} &= \lim_{x \rightarrow -1} \frac{(x-1)(x+1)}{x+1} \\
 &= \lim_{x \rightarrow -1} \frac{(x-1)\cancel{(x+1)}}{\cancel{x+1}} \\
 &= \lim_{x \rightarrow -1} (x-1) \\
 &= -1 - 1 \\
 &= -2
 \end{aligned}$$

$$\begin{aligned}
 4. \quad \lim_{x \rightarrow -2} \frac{x^2 - 4}{x + 2} &= \lim_{x \rightarrow -2} \frac{(x-2)(x+2)}{x+2} \\
 &= \lim_{x \rightarrow -2} \frac{(x-2)\cancel{(x+2)}}{\cancel{x+2}} \\
 &= \lim_{x \rightarrow -2} x - 2 \\
 &= -2 - 2 \\
 &= -4
 \end{aligned}$$

$$\begin{aligned}
 5. \quad \lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4} &= \lim_{x \rightarrow 4} \frac{(x-4)(x+4)}{x-4} \\
 &= \lim_{x \rightarrow 4} \frac{\cancel{(x-4)}(x+4)}{\cancel{x-4}} \\
 &= \lim_{x \rightarrow 4} x + 4 \\
 &= 4 + 4 \\
 &= 8
 \end{aligned}$$

$$\begin{aligned}
 6. \quad \lim_{x \rightarrow -6} \frac{x^2 - 36}{x + 6} &= \lim_{x \rightarrow -6} \frac{(x-6)(x+6)}{x+6} \\
 &= \lim_{x \rightarrow -6} \frac{(x-6)\cancel{(x+6)}}{\cancel{x+6}} \\
 &= \lim_{x \rightarrow -6} x - 6 \\
 &= -6 - 6 \\
 &= -12
 \end{aligned}$$

$$\begin{aligned}
 7. \quad \lim_{x \rightarrow -10} \frac{x^2 - 100}{x + 10} &= \lim_{x \rightarrow -10} \frac{(x-10)(x+10)}{x+10} \\
 &= \lim_{x \rightarrow -10} \frac{(x-10)\cancel{(x+10)}}{\cancel{x+10}} \\
 &= \lim_{x \rightarrow -10} x - 10 \\
 &= -10 - 10 \\
 &= -20
 \end{aligned}$$

$$\begin{aligned}
 8. \quad \lim_{x \rightarrow 4} \frac{x^2 - 2x - 8}{x - 4} &= \lim_{x \rightarrow 4} \frac{(x-4)(x+2)}{x-4} \\
 &= \lim_{x \rightarrow 4} \frac{\cancel{(x-4)}(x+2)}{\cancel{x-4}} \\
 &= \lim_{x \rightarrow 4} x + 2 \\
 &= 4 + 2 \\
 &= 6
 \end{aligned}$$

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$$\begin{aligned}
 9. \quad \lim_{x \rightarrow -1} \frac{x^2 + 5x + 4}{x + 1} &= \lim_{x \rightarrow -1} \frac{(x+4)(x+1)}{x+1} \\
 &= \lim_{x \rightarrow -1} \frac{(x+4)\cancel{(x+1)}}{\cancel{x+1}} \\
 &= \lim_{x \rightarrow -1} x + 4 \\
 &= -1 + 4 \\
 &= 3
 \end{aligned}$$

$$\begin{aligned}
 10. \quad \lim_{x \rightarrow -4} \frac{x^2 - 7x + 12}{x + 4} &= \lim_{x \rightarrow -4} \frac{(x-4)(x-3)}{x+4} \\
 &\quad \text{tiende a -8} \quad \text{tiende a -7} \\
 &= \lim_{x \rightarrow -4} \frac{\overbrace{(x-4)} \overbrace{(x-3)}}{\underbrace{x+4}} \\
 &\quad \text{tiende a cero} \\
 &= \infty
 \end{aligned}$$

$$\begin{aligned}
 11. \quad \lim_{x \rightarrow -8} \frac{x^2 - x - 72}{x + 8} &= \lim_{x \rightarrow -8} \frac{(x-9)(x+8)}{x+8} \\
 &= \lim_{x \rightarrow -8} \frac{(x-9)\cancel{(x+8)}}{\cancel{x+8}} \\
 &= \lim_{x \rightarrow -8} x - 9 \\
 &= -8 - 9 \\
 &= -17
 \end{aligned}$$

$$\begin{aligned}
 12. \quad \lim_{x \rightarrow 10} \frac{x^2 - 13x + 30}{x - 10} &= \lim_{x \rightarrow 10} \frac{(x-3)(x-10)}{x-10} \\
 &= \lim_{x \rightarrow 10} \frac{(x-3)\cancel{(x-10)}}{\cancel{x-10}} \\
 &= \lim_{x \rightarrow 10} x - 3 \\
 &= 10 - 3 \\
 &= 7
 \end{aligned}$$

$$\begin{aligned}
 13. \quad \lim_{x \rightarrow 1} \frac{x-1}{x^2 - 2x + 1} &= \lim_{x \rightarrow 1} \frac{x-1}{(x-1)(x-1)} \\
 &= \lim_{x \rightarrow 1} \frac{\cancel{x-1}}{(x-1)\cancel{(x-1)}} \\
 &= \lim_{x \rightarrow 1} \frac{1}{\underbrace{(x-1)}} \\
 &\quad \text{tiende a cero} \\
 &= \infty
 \end{aligned}$$

$$\begin{aligned}
 14. \quad \lim_{x \rightarrow 5} \frac{x-5}{x^2 - 11x + 30} &= \lim_{x \rightarrow 5} \frac{x-5}{(x-5)(x-6)} \\
 &= \lim_{x \rightarrow 5} \frac{\cancel{x-5}}{\cancel{(x-5)}(x-6)} \\
 &= \lim_{x \rightarrow 5} \frac{1}{(x-6)} \\
 &= \frac{1}{5-6} \\
 &= \frac{1}{-1} = -1
 \end{aligned}$$