

LÍMITES

EJERCICIOS RESUELTOS

LÍMITES CON FACTORIZACIÓN PARA EVITAR LA INDETERMINACIÓN 0/0

1)

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

2)

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

3)

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 5x + 6} = \lim_{x \rightarrow 2} \frac{(x+2)(x-2)}{(x-2)(x-3)} = \lim_{x \rightarrow 2} \frac{x+2}{x-3} = \frac{2+2}{2-3} = \frac{4}{-1} = -4$$

4)

$$\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{(x+3)(x-2)}{(x+2)(x-2)} = \lim_{x \rightarrow 2} \frac{x+3}{x+2} = \frac{2+3}{2+2} = \frac{5}{4}$$

5)

$$\lim_{x \rightarrow -2} \frac{x^2 - 2x - 8}{x^2 - 4} = \lim_{x \rightarrow -2} \frac{(x-4)(x+2)}{(x-2)(x+2)} = \lim_{x \rightarrow -2} \frac{x-4}{x-2} = \frac{-2-4}{-2-2} = \frac{-6}{-4} = \frac{3}{2}$$

6)

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

7)

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

8)

$$\lim_{x \rightarrow -6} \frac{x^2 - 1}{x^2 - 5x - 6} = \lim_{x \rightarrow -6} \frac{(x-1)(x+1)}{(x-6)(x+1)} = \lim_{x \rightarrow -6} \frac{x-1}{x-6} = \frac{-6-1}{-6-6} = \frac{-7}{-12} = \frac{7}{12}$$

9)

$$\lim_{x \rightarrow 4} \frac{x^2 - 7x + 6}{x^2 - 1} = \lim_{x \rightarrow 4} \frac{(x-6)(x-1)}{(x+1)(x-1)} = \lim_{x \rightarrow 4} \frac{x-6}{x+1} = \frac{4-6}{4+1} = \frac{-2}{5} = -\frac{2}{5}$$

10)

$$\lim_{x \rightarrow 8} \frac{x^2 + 6x - 16}{x^2 - 4} = \lim_{x \rightarrow 8} \frac{(x+8)(x-2)}{(x+2)(x-2)} = \lim_{x \rightarrow 8} \frac{x+8}{x+2} = \frac{8+8}{8+2} = \frac{16}{10} = \frac{8}{5}$$

11)

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

12)

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

13)

$$\lim_{x \rightarrow -5} \frac{x^2 - 10x + 25}{x^2 - 7x + 10} = \lim_{x \rightarrow -5} \frac{(x-5)(x-5)}{(x-5)(x-2)} = \lim_{x \rightarrow -5} \frac{x-5}{x-2} = \frac{-5-5}{-5-2} = \frac{-10}{-7} = \frac{10}{7}$$

14)

$$\lim_{x \rightarrow -4} \frac{x^2 - 10x + 24}{x^2 - 8x + 16} = \lim_{x \rightarrow -4} \frac{(x-6)(x-4)}{(x-4)(x-4)} = \lim_{x \rightarrow -4} \frac{x-6}{x-4} = \frac{-4-6}{-4-4} = \frac{-10}{-8} = \frac{5}{4}$$

15)

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

16)

$$\lim_{x \rightarrow -2} \frac{1}{2} \frac{8x^2 - 2x - 3}{2x + 1} = \lim_{x \rightarrow -2} \frac{(2x+1)(4x-3)}{2x+1} = \lim_{x \rightarrow -2} (4x-3) = 4\left(-\frac{1}{2}\right) - 3 = -2 - 3 = -5$$