

EXERCICIS: LÍMITS DE FUNCIONS

1. Calcula els límits següents:

$$\begin{array}{lll} \text{a)} \lim_{x \rightarrow 2} (3x^2 + 5x + 1) = & \text{d)} \lim_{x \rightarrow 3} \frac{x^2 + 2x - 15}{x^3 - 4x^2 + 3x} = & \text{g)} \lim_{x \rightarrow 1} \frac{x^2 + 2x - 15}{x^3 - 4x^2 + 3x} = \\ \text{b)} \lim_{x \rightarrow -5} \frac{x^2 + 2x - 15}{x^3 - 4x^2 + 3x} = & \text{e)} \lim_{x \rightarrow 2} \frac{3x + 1}{x^2 - 1} = & \text{h)} \lim_{x \rightarrow -5} \frac{-2}{x^2 + 5x} = \\ \text{c)} \lim_{x \rightarrow -2} \frac{x^3 + 2x^2 - x - 2}{x^3 + 3x^2 + 3x + 2} = & \text{f)} \lim_{x \rightarrow 2} \frac{4}{x - 2} = & \text{i)} \lim_{x \rightarrow -5} \frac{x^2 + 10x + 25}{x^2 - 25} \end{array}$$

2. Calcula els límits següents:

$$\begin{array}{lll} \text{a)} \lim_{x \rightarrow +\infty} (2x^2 + x + 1) = & \text{c)} \lim_{x \rightarrow +\infty} (4x^3 + 5x^2 - x + 1) = & \text{e)} \lim_{x \rightarrow +\infty} (-x^4 + 1) = \\ \text{b)} \lim_{x \rightarrow -\infty} (2x^2 + x + 1) = & \text{d)} \lim_{x \rightarrow -\infty} (4x^3 + 5x^2 - x + 1) = & \text{f)} \lim_{x \rightarrow -\infty} (-x^4 + 1) = \end{array}$$

3. Calcula els límits següents:

$$\begin{array}{ll} \text{a)} \lim_{x \rightarrow +\infty} \frac{2x^2 + x + 1}{x^2 + 3} = & \text{i)} \lim_{x \rightarrow -\infty} \frac{2x^2 - 2}{x^3 - 1} = \\ \text{b)} \lim_{x \rightarrow -\infty} \frac{x^3 + 2x}{x + 1} = & \text{j)} \lim_{x \rightarrow +\infty} \frac{3x^4 + 1}{x^3 - 1} = \\ \text{c)} \lim_{x \rightarrow +\infty} \frac{x^3 - 5x + 4}{x^5 + 3x^3 - 7x} = & \text{k)} \lim_{x \rightarrow -\infty} \frac{3x^4 + 1}{x^3 - 1} = \\ \text{d)} \lim_{x \rightarrow -\infty} \frac{x^3 - 5x + 4}{x^5 + 3x^3 - 7x} = & \text{l)} \lim_{x \rightarrow +\infty} \frac{1}{x^2} = \\ \text{e)} \lim_{x \rightarrow +\infty} \frac{3x^3 - 4x^2 - 5}{4x^3 + 5x - 7} = & \text{m)} \lim_{x \rightarrow -\infty} \frac{1}{x^2} = \\ \text{f)} \lim_{x \rightarrow +\infty} \frac{-3x^2 + 7x + 8}{-5x^2 + 1} = & \text{n)} \lim_{x \rightarrow -\infty} \frac{1}{x^3} = \\ \text{g)} \lim_{x \rightarrow +\infty} \frac{-4}{x^3 + 2x^2 + 1} = & \text{o)} \lim_{x \rightarrow -\infty} \frac{3 + 4x - 10x^3}{1 - 3x} = \\ \text{h)} \lim_{x \rightarrow -\infty} \frac{-4}{x^3 + 2x^2 + 1} = & \text{p)} \lim_{x \rightarrow +\infty} \sqrt{6x^3 + 2x^2 + 3} = \end{array}$$

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4. Calcula el límit de f quan:

$x \rightarrow 0, x \rightarrow -1, x \rightarrow 1, x \rightarrow 2, x \rightarrow 3, x \rightarrow 5, x \rightarrow 6, x \rightarrow 10, x \rightarrow 12$:

$$f(x) = \begin{cases} \frac{x+1}{x^2-1} & \text{si } x \leq 2 \\ 2x-3 & \text{si } 2 < x \leq 5 \\ \frac{10}{x-5} & \text{si } 5 < x \leq 10 \\ x+8 & \text{si } x > 10 \end{cases}$$