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DEBER No.2 Límite de funciones

NOTA: LA RESOLUCION DE LOS EJERCICIOS ESTA AL FINAL DE LOS EJERCICIO PROPUESTOS

1. En los ejercicios siguientes, evalúe el límite (si existe):

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

$\lim_{y\to 1}\frac{y^2-2}{2y+3}$

$\lim_{z\to -3}\frac{z^2+z-9}{z+2}$

$\lim_{x\to -2}\frac{x^2-3x-4}{x^2-4x-14}$

$\lim_{x\to 1}\frac{2x^2+x-4}{3x^3+2x-6}$

$\lim_{t\to 4}\sqrt{\frac{t-4}{t^2-1}}$

$\lim_{x\to 4}\frac{2x}{16-x^2}$

$\lim_{x\to 0}\frac{x^2-5}{2x^3-3x+1}$

$\lim_{t\to 2}\frac{\sqrt{t}-\sqrt{4}}{t^2-16}$

$\lim_{s\to 0}\frac{\sqrt{9-s}-2}{1-s}$

$\lim_{x\to 1}\frac{x^4-6x^2+8x-4}{x^4-2x^3+2x-1}$

$\lim_{x\to 1}\frac{x^2-4}{x^2-2|x-1|-3}$

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

$$\lim_{x\to 1}\frac{\sqrt{2x+1}+3\sqrt{2x-1}}{3\sqrt{x+1}-\sqrt{2x-1}}$$

$$f_{(x)}=\begin{cases} x^2+4x-8, \text{ si } x\geq -3 \\ x+4, \text{ si } x\leq -3 \end{cases} \qquad \lim_{x\to -3} f_{(x)}=?$$

EJERCICIOS RESUELTOS

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

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

$\lim_{x\to 2}(12-2+4)$

$\lim_{x\to 2}(14)$ //

2) $\lim_{z\to -3}\frac{z^2+z-9}{z+2}$

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

$\lim_{z\to -3}=3$ //

3) $\lim_{x\to 1}\frac{2x^2+x-4}{3x^2+2x-6}$

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

$\lim_{x\to 1}\frac{2+1-4}{3^2+2-6}=\frac{1}{}$ //

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

$\lim_{x\to 4}\frac{2(4)}{16-4^2}=\frac{8}{0}$ → Indeterminacion Tipo $\frac{K}{0}$

Limites laterales

$\lim_{x\to 4^+}\frac{2(4^+)}{16-4^2}=\frac{8}{0}=-\infty$

$\lim_{x\to 4^-}\frac{2(4^-)}{16-(4^-)^2}=\frac{8}{0}=+\infty$

No existe Limite de la función en $x\to 4$

5) $\lim_{x\to 2}\frac{\sqrt{t}-\sqrt{4}}{t^2-16}$

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

$\lim_{x\to 2}\frac{\sqrt{2}-2}{4-16}$

$\lim_{x\to 2}\frac{2-\sqrt{2}}{12}$ //

6) $\lim_{x\to 1}\frac{x^4-6x^2+8x-4}{x^4-2x^3+2x-1}$

$\lim_{x\to 1}\frac{1^4-6(1)^2+8(1)-4}{1^4-2(1)^3+2(1)-1}$

$\lim_{x\to 1}\frac{1-6+8-4}{1-2+2-1}=-\frac{1}{0}$ indeterminacio

Limites laterales

$\lim_{x\to 1^+}\frac{1^4-6(1)^2+8(1^+)-4}{1^4-2(1)^3+2(1)-1}=-\frac{1}{0}=-\infty$

$\lim_{x\to 1^-}\frac{1^4-6(1^-)^2+8(1^-)-4}{1^4-2(1^-)^3+2(1^-)-1}=-\frac{1}{0}=+\infty$

No existe //

7) $\lim_{y \to 1} \frac{y^2-2}{2y^3+3}$

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

$\lim_{y \to 1} \frac{1-2}{2+3} =$

$\lim_{y \to 1} -\frac{1}{5}$ //

8) $\lim_{x \to 2} \frac{x^2-3x-4}{x^2-4x-14}$

$\lim_{x \to 2} \frac{2^2-3(2)-4}{2^2-4(2)-14}$

$\lim_{x \to 2} \frac{4-6-4}{4+8-14}$

$\lim_{x \to 2} \frac{-6}{-12} = -3$ //

9) $\lim_{t \to 4} \sqrt{\frac{t-4}{t^2-1}}$

$\lim_{t \to 4} \sqrt{\frac{4-4}{4^2-1}}$

$\lim_{t \to 4} \sqrt{\frac{0}{15}}$

$\lim_{t \to 4} = 0$ //

10) $\lim_{x \to 0} \frac{x^2-5}{2x^3-3x^2+1}$

$\lim_{x \to 0} \frac{0^2-5}{2(0)^3-3(0)^2+1}$

$\lim_{x \to 0} \frac{0-5}{0-0+1} = -\frac{5}{1} = -5$ //

11) $\lim_{s \to 0} \frac{\sqrt{9-s}-2}{1-s}$

$\lim_{s \to 0} \frac{\sqrt{9-0}-2}{1-0}$

$\lim_{s \to 0} \frac{\sqrt{9}-2}{1}$

$\lim_{s \to 0} \frac{3-2}{1} = \frac{1}{1} = 1$ //

12) $\lim_{x \to 1} \frac{x^2-4}{x^2-2|x-1|-3}$

$\lim_{x \to 1} \frac{1^2-4}{1^2-2|1-1|-3}$

$\lim_{x \to 1} \frac{1-4}{1-2|0|-3} = \frac{-3}{-2}$

$\lim_{x \to 1} \frac{3}{2}$ //

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

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

$\lim_{x\to 2}\left(\frac{6-2}{8-4}-\frac{16-1}{6-2}\right)$

$\lim_{x\to 2}\left(\frac{4}{4}-\frac{15}{4}\right)$

$\lim_{x\to 2}\left(\frac{4-15}{4}\right)$

$\lim_{x\to 2} -\frac{11}{4}$ //

14) $\lim_{x\to 1}\frac{\sqrt{2x+1}+3\sqrt{2x-1}}{3\sqrt{x+1}-\sqrt{2x-1}}$

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

$\lim_{x\to 1}\frac{\sqrt{3}+3\sqrt{1}}{3\sqrt{2}-\sqrt{1}}=$

$\lim_{x\to 1}\frac{\sqrt{3}+3}{3\sqrt{2}-1}$

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

$\lim_{x\to 1}\frac{3\sqrt{6}+\sqrt{3}+9\sqrt{2}+3}{17}$

15)

$$f(x)=\begin{cases} x^2+4x-8 & \text{si } x\geq -3 \\ x+4 & \text{si } x\leq -3 \end{cases}$$

$\lim_{x\to -3} f(x)$ = No existe //

$\lim_{x\to -3^-} x+4$

$\lim_{x\to -3} -3+4=1$

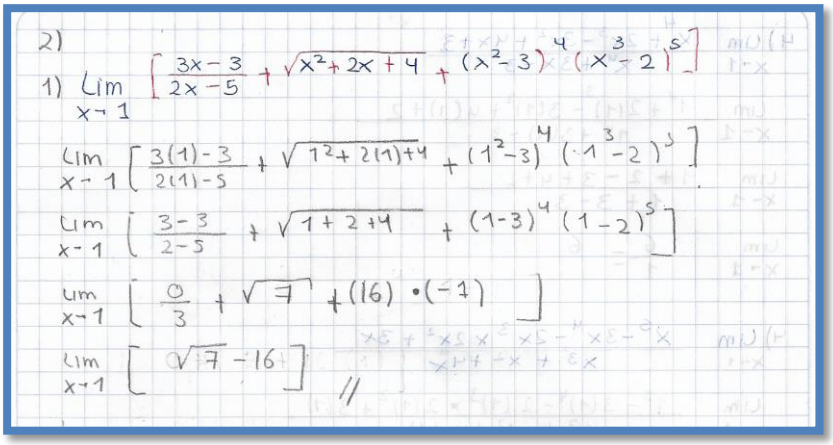
$\lim_{x\to -3} x^2+4(x)-8$

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

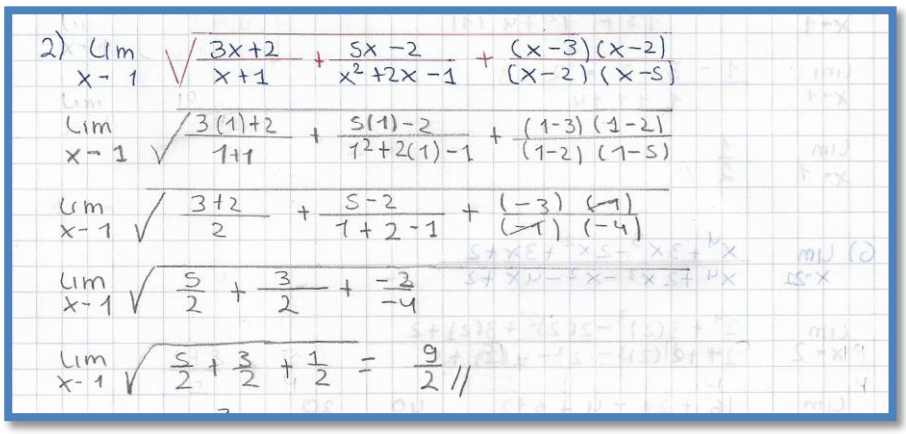
$\lim_{x\to -3} 9+12-8=-11$

2. *Calcular los siguientes límites:*

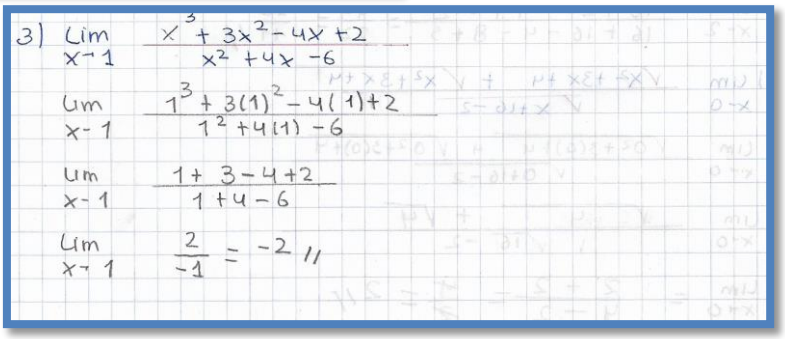
$$\lim_{x\to 1}\left[\frac{3x-3}{2x-5}+\sqrt{x^2+2x+4}+\left(x^2-3\right)^4\left(x^3-2\right)^5\right]$$



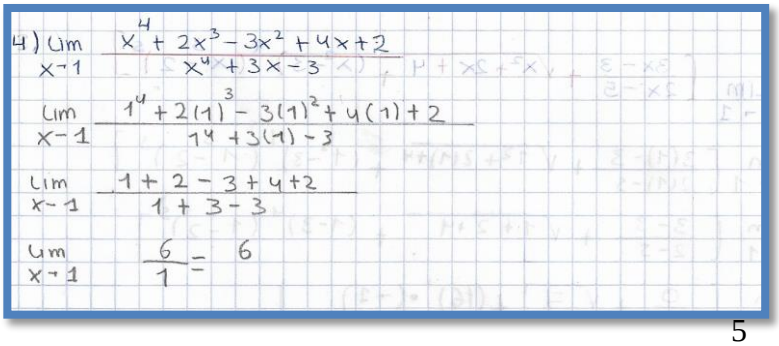
$$\lim_{x\to 1}\sqrt{\frac{3x+2}{x+1}+\frac{5x-2}{x^2+2x-1}+\frac{(x-3)(x-2)}{(x-2)(x-5)}}$$



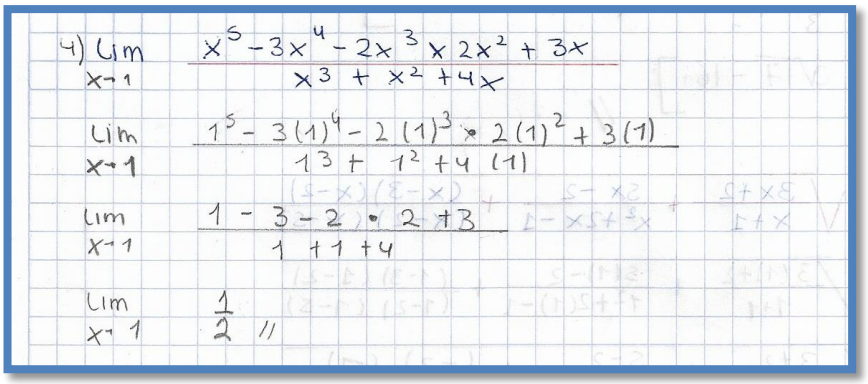
$$\lim_{x\to 1}\frac{x^3+3x^2-4x+2}{x^2+4x-6}$$



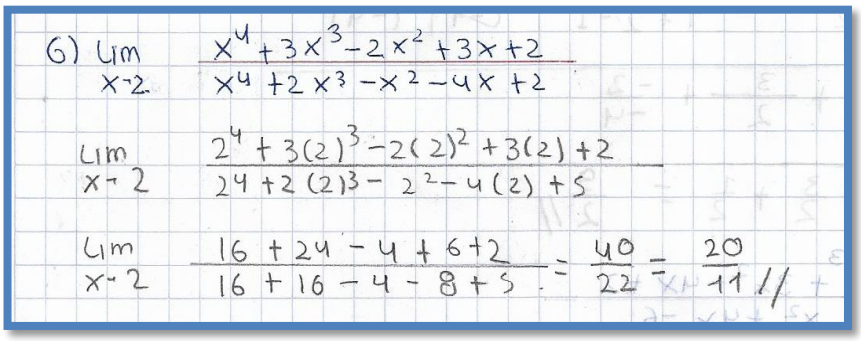
$$\lim_{x\to 1}\frac{x^4+2x^3-3x^2+4x+2}{x^4+3x-3}$$



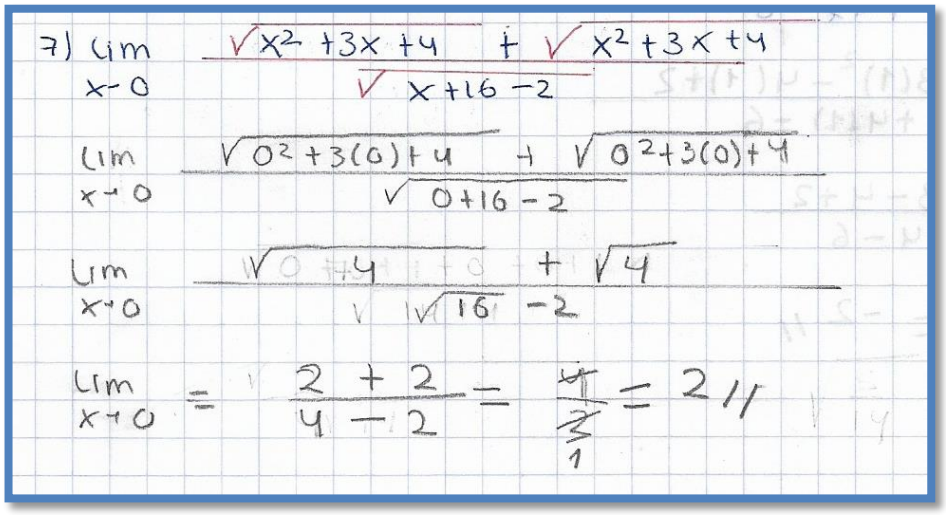
$$\lim_{x\to 1}\frac{x^5+3x^4-2x^3\acute{}2x^2+3x}{x^3+x^2+4x}$$



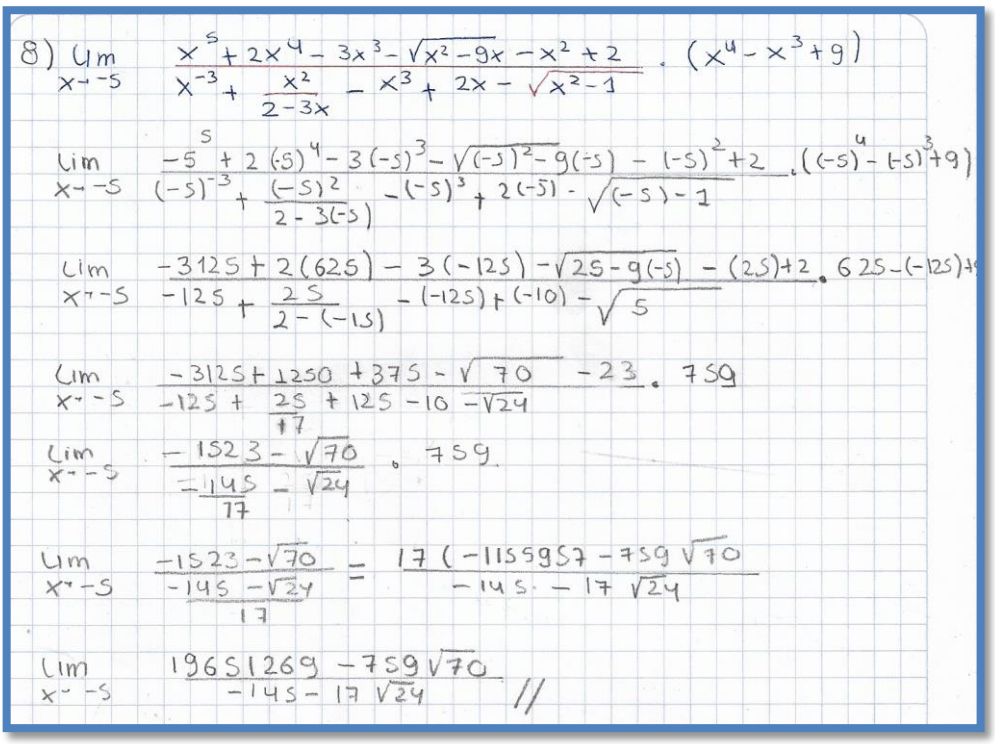
$$\lim_{x\to 2}\frac{x^4+3x^3-2x^2+3x+2}{x^4+2x^3-x^2-4x+2}$$



$$\lim_{x\to 0}\frac{\sqrt{x^2+3x+4}+\sqrt{x^2+3x+4}}{\sqrt{x+16}-2}$$



$$\lim_{x\to -5} \frac{x^5+2x^4-3x^3-\sqrt{x^2-9x}-x^2+2}{x^{-3}+\dfrac{x^2}{2-3x}-x^3+2x-\sqrt{x^2-1}}\cdot\left(x^4-x^3+9\right)$$



$$\lim_{x\to 4} \sqrt{x^3+x^2+x-5}-\sqrt{3x^2+4x+10}-\frac{6x^2+3x-5}{x^2-1}$$