① e) $f(x)=\dfrac{2x^2}{x^2-1}$

① $Dom\, f = \mathbb{R}-\{-1,1\}$ $\quad x^2-1=0 \Rightarrow x^2=1 \rightarrow x=\pm\sqrt{1} \rightarrow x=\pm 1$

② P. corte ejes

Eje X $(y=0) \Rightarrow \dfrac{2x^2}{x^2-1}=0 \Rightarrow 2x^2=0 \Rightarrow x^2=0 \Rightarrow x=0 \Rightarrow (0,0)$

Eje Y $(x=0) \Rightarrow f(0)=0 \Rightarrow (0,0)$

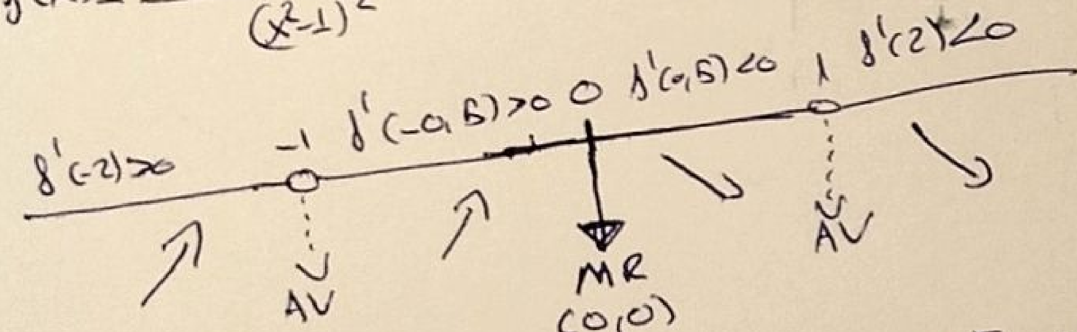
③ A. verticales

$\lim\limits_{x\to 1}\dfrac{2x^2}{x^2-1}=\dfrac{2}{0} \Rightarrow$ AV en $x=1$ $\quad \lim\limits_{x\to -1}\dfrac{2x^2}{x^2-1}=\dfrac{2}{0} \Rightarrow$ AV en $X=-1$

④ Monotonía $(f'(x)=0)$

$f'(x)=\dfrac{4x\cdot(x^2-1)-2x^2\cdot 2x}{(x^2-1)^2}=\dfrac{4x^3-4x-4x^3}{(x^2-1)^2}=\dfrac{-4x}{(x^2-1)^2}$ // $\dfrac{-4x}{(x^2-1)^2}=0 \Rightarrow -4x=0 \Rightarrow \boxed{x=0}$

$f'(x)=\dfrac{-4x}{(x^2-1)^2}$



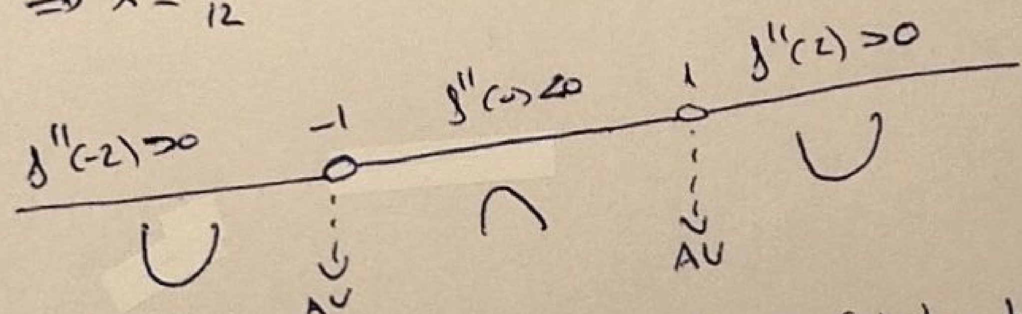
⑤ Curvatura $(f''(x)=0)$

$f''(x)=\dfrac{-4\cdot(x^2-1)^2-(-4x)\cdot 2(x^2-1)2x}{[(x^2-1)^2]^2}=\dfrac{\cancel{(x^2-1)}[-4(x^2-1)-(-4x)\cdot 2\cdot 2x]}{(x^2-1)^{\cancel{4}3}}$

$=\dfrac{-4x^2+4+16x^2}{(x^2-1)^3}=\dfrac{12x^2+4}{(x^2-1)^3}$ // $\dfrac{12x^2+4}{(x^2-1)^3}=0 \Rightarrow 12x^2+4=0 \Rightarrow 12x^2=-4$

$\Rightarrow x^2=\dfrac{-4}{12} \Rightarrow x=\pm\sqrt{\dfrac{-4}{12}}$ $\nexists$ solución

$f''(x)=\dfrac{12x^2+4}{(x^2-1)^3}$



⑥ R. infinitas $\quad f(x)=\dfrac{2x^2 \rightarrow G:2}{x^2-1 \rightarrow G:2}$ / $\Rightarrow$ Asíntota horizontal $y=2$

$\lim\limits_{x\to\infty}\dfrac{2x^2}{x^2-1}=\lim\limits_{x\to\infty}\dfrac{2x^2}{x^2}=2$

R. GRÁFICA