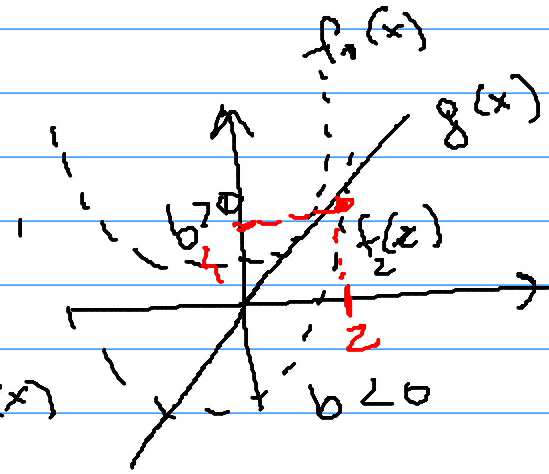
CLAVE - Práctico 3 (2; 6; 14; 16) 13/5

(2) $f(x) = x^2 + ax + b$ a, b ctes

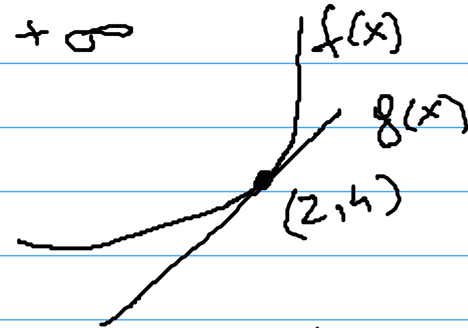
Hallar a, b / $y = 2x$ sea tangente al gráfico de $f(x)$ en $(2,4)$

* $f(x) = x^2 + ax + b$
* $g(x) = 2x$



$\Rightarrow$

$\lim_{x \to +\infty} f(x) = +\infty$



$f(2) = 4 \Rightarrow 4 + 2a + b = 4 \Rightarrow \boxed{2a = -b}$

$g(2) = 4$

Si tomo $a = 1$

$-b = 2 \Rightarrow b = -2$

$\boxed{f(x) = x^2 + x - 2}$

$\hookrightarrow f(2) = 4$? $f(2) = 4 + \cancel{2 - 2}^{0} = 4$

$C = \{ a, b \in \mathbb{R} \ / \ 2a + b = 0 \}$

6) $f(x) = \begin{cases} \dfrac{x}{x+1} - L|x+1| & , x \geq -2 \\ ax^2+b & , x < -2 \end{cases}$

hallar a, b para que f derivable $x=-2$

$$\lim_{x\to -2^-} \frac{f(x) - f(-2)}{x-(-2)} = \lim_{x\to -2^+} \frac{f(x) - f(-2)}{x+2}$$

$$\lim_{x\to -2^+} \frac{\overbrace{\left(\frac{x}{x+1} - L|x+1|\right)}^{=f(x)} - (2)}{\boxed{x+2}} \Rightarrow 0/0 \text{ indet}$$

aplicar L'Hopital $\lim_{x\to A} \frac{f(x)}{g(x)} = \lim_{x\to A} \frac{f'(x)}{g'(x)}$

$= 2$

$$\left(\frac{x}{x+1}\right)' = \frac{x'(x+1) - x\cdot(x+1)'}{(x+1)^2}$$

$$\left(x\cdot(x+1)^{-1}\right)'$$

$$\lim_{x\to -2^-} \frac{ax^2+b-(4a+b)}{x+2} \Rightarrow 0/0 \text{ indet}$$

$$\Rightarrow \lim_{x\to -2^-} \frac{ax^2-4a}{x+2} \Rightarrow 0/0 \text{ indet}$$

$$\Rightarrow \lim_{x\to -2^-} \frac{a\cancel{(x+2)}(x-2)}{x+2} = -4a = 2$$

$a = -1/2$

$$\lim_{x\to -2^-} \frac{\overline{ax^2+b-4a-b}}{x+2} = \lim_{x\to -2^-} 2ax$$

↑ L'hopital.

$$= \lim_{x\to -2^-} \frac{2ax}{1} = -4a$$

$$x' = \dot{x} = \frac{\partial}{\partial x}\left(ax^2+b-4a-b\right) = 2ax$$

$$\frac{\partial}{\partial x}(x+2) = 1$$

$$\Rightarrow f(x) = \begin{cases} \frac{x}{x+1} - L|x+1|, & x \geq -2 \\ -1/2\, x^2 + b, & x < -2 \end{cases}$$

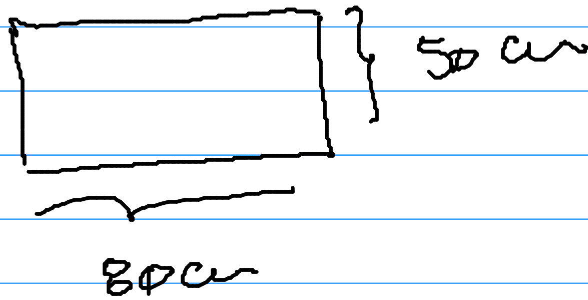
$$2 = \lim_{x\to -2^-} \frac{-1/2\, x^2 + b - \left[-1/2 \cdot 4 + b\right]}{x+2}$$

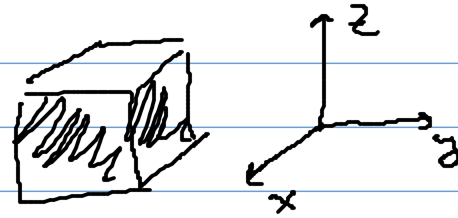
idea compañera

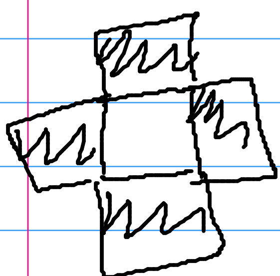
$\Rightarrow$ debemos ver como hallar el b?

6

14

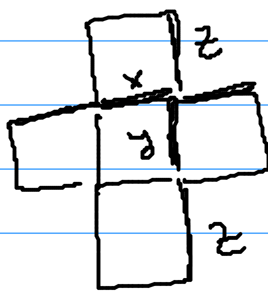


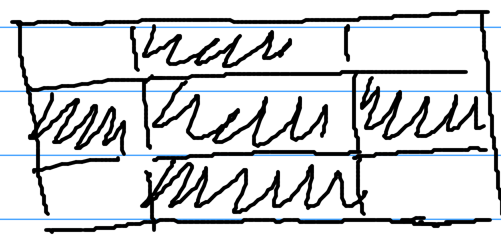




maximizar el volumen

$$V(x,y,z) = x \cdot y \cdot z$$





pensarlo!

(16) $[1/3, 2]$ / dado $x \in [1/3, 2]$ la suma con su inverso sea

a) mínima

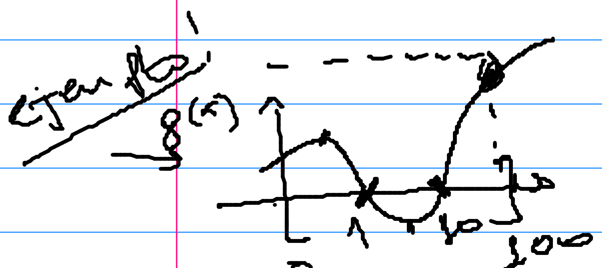
b) máxima

$$\boxed{f(x) = x + \frac{1}{x} = x + x^{-1}}$$

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

$$f'(x) = 0 \iff x^2 - 1 = 0 \iff \boxed{x = \pm 1}$$

ejemplo: $g(x)$

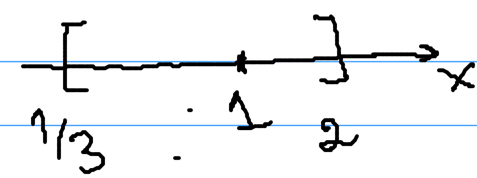


$Z_f = \{x \in \mathbb{R} \,/\, f(x) = 0\}$

Sg f: $+ \quad 0 \quad - \quad 0 \quad +$ (1, 10)

Sg f': $+ \quad 0 \quad - \quad 0 \quad +$ (−1, 1)

máx relativo   mín relativo

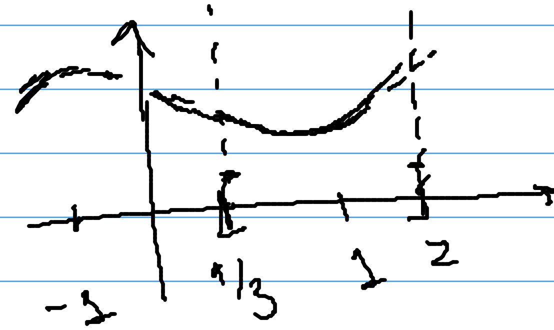


$f(x) = x + x^{-1}$

mín de $f(x)$ está $x = 1$

$f(1/3) \gtrless f(2)$?

teo valor medio (Buscar) ¡leer!



H) f cont ...

f deri ...

T) $\exists c \in \ldots \,/$

$f(c) = \frac{\ldots - \ldots}{\ldots - \ldots}$

$$(\mathrm{Sen}(f))' = \mathrm{Cos}(f) \cdot f'$$

$$\mathrm{Sen}(x) = \mathrm{Cos}(x) \cdot x' = \mathrm{Cos}(x) \cdot 1$$
$$= \mathrm{Cos}(x)$$

$$(\mathrm{Cos}(f))' = -\mathrm{Sen}(f) \cdot f'$$

$$\mathrm{Sen}(\underbrace{x+x^2}_{f}) = \mathrm{Cos}(x+x^2) \cdot f'$$

$$\Rightarrow = \mathrm{Cos}(x+x^2) \cdot (2x+1)$$

$$f' = 2x+1$$

$$f(x) = \mathrm{Sen}\left(\underbrace{\frac{\mathrm{Cos}(x)}{x}}_{f}\right) = \mathrm{Cos}(f) \cdot f'$$

$$f = \frac{\mathrm{Cos}(x)}{x} \Rightarrow f' =$$

$$f(x) = \mathrm{Sen}\left(\overbrace{\frac{\mathrm{Cos}(\mathrm{Sen}\, x^2)}{tg(x^8)}}^{f}\right) = \mathrm{Cos}(f) \cdot f'$$

$$f = \frac{\overbrace{\mathrm{Cos}(\mathrm{Sen}(x^2))}^{N}}{\underbrace{tg(x^8)}_{D}} \Rightarrow f' = \frac{N' \cdot D - N \cdot D'}{D^2}$$

$$N' = \mathrm{Cos}(\underbrace{\mathrm{Sen}(x^2)}_{h}) = -\mathrm{Sen}(\mathrm{Sen}(x^2)) \cdot h'$$

$$h' = (\mathrm{Sen}(x^2))'$$

hallo h'