

Conexión T E2 - C

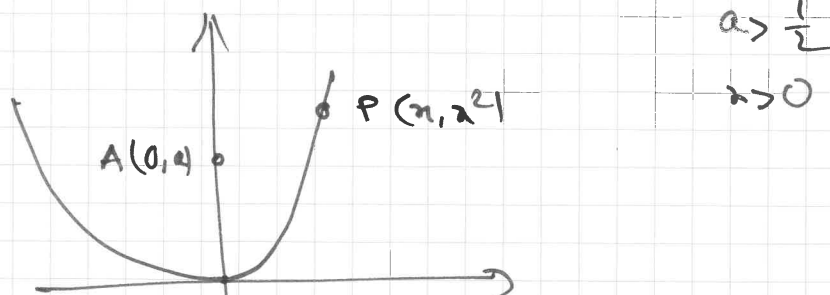
Ex 1

a) $f'(x) = -\frac{1}{2} \sqrt{1 + \sin(x)}$

b) $g'(u) = 2u \tan(1 - u^2)$

c) $h'(t) = -\frac{1 + \tan^2(t)}{\tan^2(t)} = -\frac{1}{\sin^2(t)}$

Ex 2



$$a > \frac{1}{2}$$

$$x > 0$$

$$\text{dist}(A, P) = \sqrt{x^2 + (x^2 - a)^2} = d(x) \quad x > 0$$

$$d'(x) = \frac{2x + 2(x^2 - a) \cdot 2x}{2\sqrt{x^2 + (x^2 - a)^2}} = \frac{x + 2x(x^2 - a)}{2\sqrt{x^2 + (x^2 - a)^2}}$$

$$= \frac{x(1 + 2(x^2 - a))}{2\sqrt{x^2 + (x^2 - a)^2}}$$

$$x > 0 \quad d'(x) = 0$$

$$x(1 + 2x^2 - 2a) = 0$$

$$2x^2 = 2a - 1 \quad x^2 = a - \frac{1}{2} > 0$$

$$x > 0$$

$$x = \sqrt{a - \frac{1}{2}}$$

donc

x	0	$\sqrt{a - \frac{1}{2}}$	$+\infty$
$d'(x)$		-	+
$d(x)$			

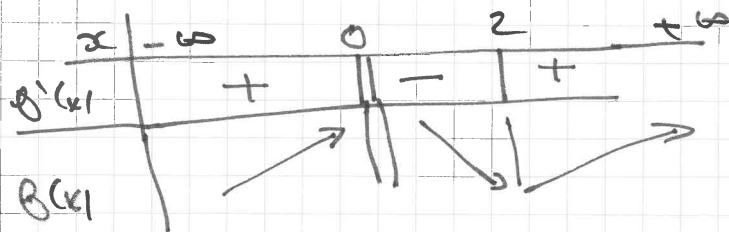
minimum de distance pour $x = \sqrt{a - \frac{1}{2}}$

$$P\left(\sqrt{a - \frac{1}{2}}, a - \frac{1}{2}\right)$$

Ex3

a) $D(f) = \mathbb{R}^*$

b) $f'(x) = \frac{e^x}{x^3} (x-2)$



c) $f''(x) = \frac{e^x}{x^4} (x^2 - 4x + 6)$

$\Delta = 16 - 4 \cdot 6 < 0$

$f''(x) > 0 \quad x \in \mathbb{R}^*$

f convexe sur $\mathbb{R}^*$

a) pas de pt d'inflexion.

Ex4 a) voir TE2-B

b) voir TE2-B

c) $\lim_{x \rightarrow +\infty} e^{-x} \cos(x) \sin(x)$

$-1 \leq \cos(x) \sin(x) \leq 1$

$-e^{-x} \leq e^{-x} \cos(x) \sin(x) \leq e^{-x}$

$\lim_{x \rightarrow +\infty} e^{-x} = 0$

par le théorème de l'encadrement

$\lim_{x \rightarrow +\infty} e^{-x} \cos(x) \sin(x) = 0$