Clase de consulta para el parcial

$$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = \sqrt{(5-6)^2+\left(\frac{3}{2}-\frac{1}{2}\right)^2} = \sqrt{1+1} = \sqrt{2}$$

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

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

$$x \longrightarrow \sqrt{x-2} \xrightarrow{\frac{1}{x}} \frac{1}{\sqrt{x-2}}$$

$x=1 \longrightarrow \sqrt{-1} \notin \mathbb{R}$

$x=2 \longrightarrow \frac{1}{0} \notin \mathbb{R}$

$g(x) = \sqrt{x-2}$

$x-2 \geq 0$

$x \geq 2$

$\mathrm{Dom}(g) = [2, +\infty)$

Para $x=2$, $\sqrt{x-2}=0$

entonces $h(x) = \frac{1}{x}$ no está definida.

$$\mathrm{Dom}(f) = (2, +\infty)$$

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

$$f'(x) = \lim_{h \to 0} \frac{f(x+h)-f(x)}{h}$$

$f(x) = \frac{1}{2x+1}$ $\qquad f(x+h) = \frac{1}{2(x+h)+1}$

$$\lim_{h \to 0} \frac{\frac{1}{2(x+h)+1} - \frac{1}{2x+1}}{h}$$

$$\frac{1}{4}-\frac{1}{3}=\frac{1\times 3}{4\times 3}-\frac{1\times 4}{3\times 4}$$

$$\frac{1}{8}-\frac{1}{2}=\frac{1}{8}-\frac{1\times 4}{2\times 4}$$

$$\frac{\cancel{6}}{8}=\frac{\cancel{2}\times 3}{\cancel{2}\times 4}$$

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

$$=\frac{1\,(2x+1)}{(2x+2h+1)(2x+1)}-\frac{1\,(2x+2h+1)}{(2x+1)\,(2x+2h+1)}=\frac{\cancel{2x}+\cancel{1}-\cancel{2x}-2h-\cancel{1}}{(2x+1)\,(2x+2h+1)}$$

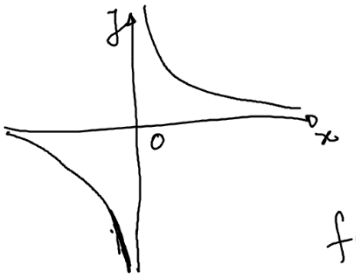
$$=\frac{-2h}{(2x+1)(2x+2h+1)}$$

$$f'(x)=\lim_{h\to 0}\frac{\frac{-2h}{(2x+1)\,(2x+2h+1)}}{\frac{h}{1}}=\lim_{h\to 0}\frac{-2\cancel{h}}{(2x+1)\,(2x+2h+1)}\cdot\frac{1}{\cancel{h}}=$$

$$=\lim_{h\to 0}\frac{-2}{(2x+1)(2x+2\underbrace{h}_{0}+1)}=\frac{-2}{(2x+1)\,(2x+1)}$$

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

5) $y=\frac{1}{x}$ $\qquad f(x)=\frac{1}{x}$ $\qquad f(3)=\frac{1}{3}$



$\left(3,\ \frac{1}{3}\right)$ $\qquad f\left(\frac{2}{5}\right)=\frac{1}{\frac{2}{5}}=\frac{5}{2}$

Ecuación de la tangente en $\left(a,\frac{1}{a}\right)$

$a\neq 0$

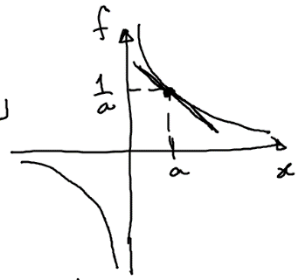
$f(x)=\frac{1}{x}$

$f(x) = \frac{1}{x}$

$\left(\frac{f}{g}\right)' = \frac{f' \cdot g - f \cdot g'}{g^2}$

$f'(x) = \frac{0 \cdot x - 1 \cdot 1}{x^2} = -\frac{1}{x^2}$ ✓

Ecuación de la tangente en $\left(a, \frac{1}{a}\right)$



$f'(a) = -\frac{1}{a^2}$ → pendiente de la recta tangente

$y = mx + n$ → $y = -\frac{1}{a^2}x + n$ → $y + \frac{1}{a^2}x = n$

$m = -\frac{1}{a^2}$

$\frac{1}{a} + \frac{1}{a^{\cancel{2}}}\cancel{a} = n$ → $n = \frac{2}{a}$

$t) \; y = -\frac{1}{a^2}x + n$

$n = \frac{2}{a}$

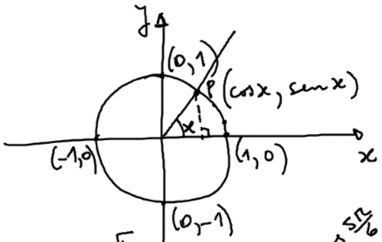
$t) \; y = -\frac{1}{a^2}x + \frac{2}{a}$

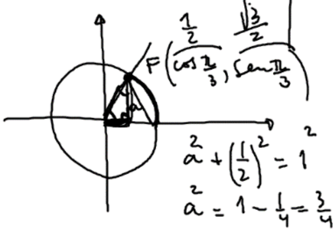
Por ej: la recta tangente al gráfico en $\left(3, \frac{1}{3}\right)$ es:

$t) \; y = -\frac{1}{9}x + \frac{2}{3}$

Circunferencia trigonométrica

$\mathcal{C}_{0,1}$

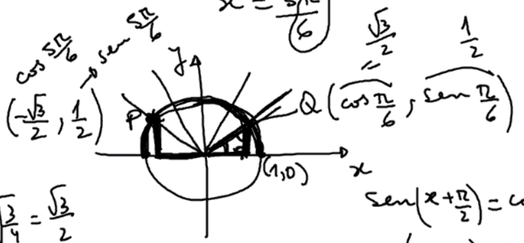




$a^2 + \left(\frac{1}{2}\right)^2 = 1^2$

$a^2 = 1 - \frac{1}{4} = \frac{3}{4} \rightarrow a = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$

$x = \frac{5\pi}{6}$



$\text{sen}\left(x + \frac{\pi}{2}\right) = \cos x$

$\cos\left(x + \frac{\pi}{2}\right) = \text{sen } x$

$\cos(a) = \text{sen}\left(a + \frac{\pi}{2}\right)$

$\text{sen}(a) = \cos\left(a + \frac{\pi}{2}\right)$

$\text{sen}(a+b)$

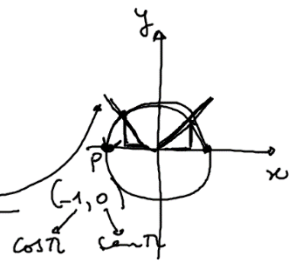
$\cos(a+b)$

$\text{sen}(2x)$

$\cos(2x)$

α	
$\frac{2\pi}{3}$	
$\frac{3\pi}{4}$	
$\frac{5\pi}{6}$	
π	
$\frac{7\pi}{6}$	
$\frac{5\pi}{4}$	
$\frac{7\pi}{4}$	

$\frac{7\pi}{6} = \frac{(6+1)\pi}{6} = \frac{6\pi}{6} + \frac{\pi}{6} = \pi + \frac{\pi}{6}$



$\cos\pi = -1$

$\text{sen}\,\pi = 0$

$\tan\pi = \frac{0}{-1} = 0$

$$\operatorname{sen} \frac{7\pi}{6} = \operatorname{sen}\left(\pi + \frac{\pi}{6}\right)$$

$$\operatorname{sen}(a+b) = \cos(a) \cdot \operatorname{sen}(b) + \operatorname{sen}(a) \cdot \cos(b)$$

$\operatorname{sen} \pi = 0$

$\cos \pi = -1$

$\operatorname{sen} \frac{\pi}{6} = \frac{1}{2}$

$\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

$$\operatorname{sen}\left(\frac{7\pi}{6}\right) = \operatorname{sen}\left(\pi + \frac{\pi}{6}\right) = \cos(\pi) \cdot \operatorname{sen}\left(\frac{\pi}{6}\right) + \operatorname{sen}(\pi) \cdot \cos\left(\frac{\pi}{6}\right) =$$

$$= -1 \cdot \frac{1}{2} + 0 \cdot \frac{\sqrt{3}}{2} = -\frac{1}{2}$$

3) $f(x) = \operatorname{sen}(3x^2 + 2x)$

$f(x) = \frac{4}{x+3}$

$f(x) = \tan^2(x+2)$

$f(x) = e^{x^2+2x} \cdot (x+1)$

$$f(x) = \operatorname{sen}(3x^2 + 2x)$$

$$\cancel{f'(x) = \cos\underbrace{(3x^2+2x)}.(9x^2+2)} \qquad f'(x) = \cos(3x^2+2x).(6x+2)$$

$$(3x^2)' = 3.2x = 6x$$

$$f(x) = \frac{4}{x+3}$$

$$f'(x) = \frac{0.\overbrace{(x+3)}^{0} - 4.\overbrace{(1+0)}^{1}}{(x+3)^2} = \frac{-4}{(x+3)^2}$$

$$f(x) = \tan^2(x+2) = (\underbrace{\tan(x+2)}_{u})^2 \qquad x \to x+2 \to \tan(x+2) \to (\ \ )^2$$

$$f'(x) = 2.(\tan(x+2)).(\tan(x+2))'$$

$$f'(x) = 2.(\tan(x+2)).(1+\tan^2(x+2)).1$$

f	f'
u^2	$2u.u'$
x^2	$2x$
$\tan(v)$	$(1+\tan^2 v).v'$
$\tan(x)$	$1+\tan^2(x)$

$$\tan(x) = \frac{\operatorname{sen}(x)}{\cos(x)}$$

$$(\tan(x))' = \frac{\cos(x).\cos(x) - \operatorname{sen}(x).(-\operatorname{sen}(x))}{\cos^2(x)} = \frac{\cos^2(x) + \operatorname{sen}^2(x)}{\cos^2 x} =$$

$$= \frac{1}{\cos^2(x)}$$

$$= \frac{\cos^2(x)}{\cos^2(x)} + \frac{\operatorname{sen}^2(x)}{\cos^2(x)} = \boxed{1+\tan^2(x)}$$

$$f(x) = e^{x^2+2x} \cdot (x+1)$$

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

$$\left(e^{x^2+2x}\right)' = e^{x^2+2x} \cdot (2x+2)$$

f	f'
e^u	$e^u \cdot u'$

$$(x+1)' = 1$$

$$f'(x) = \underbrace{e^{x^2+2x} \cdot (2x+2) \cdot (x+1)} + \underbrace{e^{x^2+2x} \cdot 1} =$$

$$= e^{x^2+2x} \cdot \left((2x+2)(x+1)+1\right) = e^{x^2+2x} \cdot \left(2x^2+2x+2x+2+1\right) = e^{x^2+2x} \cdot \left(2x^2+4x+3\right)$$