$X = x^3 + 1 \Rightarrow x^3 - x + 1$

$f(x) = x^3 - x + 1$

$(-2, -1)$

$f(-2) = -8 - 2 + 1 = -9$

$f(-1) = -1 \cancel{+1} \cancel{+1} = -1$

$$f(x) = \begin{cases} x^2 - 2 & si \quad x \leq 1 \\ -x & si \quad x > 1 \end{cases}$$

La derivada de f(x) en x=1....

$$f'^{-}(1) = \lim_{h \to 0^-} \frac{f(1+h) - f(1)}{h} = \lim_{h \to 0^-} \frac{(1+h)^2 - 2 - (-1)}{h}$$

$$= \lim_{h \to 0^-} \frac{2h + h^2 \cancel{+1} \cancel{-1}}{h} = \lim_{h \to 0^-} \frac{\cancel{h}(2+h)}{\cancel{h}} = \lim_{h \to 0^-} 2+h = 2+0 = 2$$

$$f'^{+}(1) = \lim_{h \to 0^+} \frac{f(1+h) - f(1)}{h} = \lim_{h \to 0} \frac{-(1+h) - (-1)}{h}$$

$$= \frac{-1 - h + 1}{h} = \frac{-\cancel{h}}{\cancel{h}} = -1$$

$$f'^{-}(1) \neq f'^{+}(1) \Rightarrow \nexists \, f'(1)$$

La derivada de $f(x)=e^{x^2}$ es:

$$h(x) = x^2 \Rightarrow h'(x) = 2 \cdot x^1 = 2 \cdot x$$
$$L(x) = e^x \Rightarrow L'(x) = e^x$$
$$f(x) = L(h(x)) \Rightarrow f'(x) = L'(h(x)) \cdot h'(x)$$
$$\Rightarrow f'(x) = e^{h(x)} \cdot 2 \cdot x \Rightarrow f'(x) = e^{x^2} \cdot 2 \cdot x$$

La ecuación de la recta tangente a la función f(x)= ln(3x/4) en el punto x=4/3 es:

$$y = f'(a)(x-a) + f(a) \Rightarrow y = f'\left(\tfrac{4}{3}\right)\left(x - \tfrac{4}{3}\right) + f\left(\tfrac{4}{3}\right)$$

$$f\left(\tfrac{4}{3}\right) = \ln\left(\frac{3 \cdot \frac{4}{3}}{4}\right) = \ln(16) = 2 \cdot \ln(4)$$
$$f\left(\tfrac{4}{3}+h\right) = \ln\left(\frac{3 \cdot \left(\frac{4}{3}+h\right)}{4}\right) = \ln\left(\frac{4+3h}{4}\right) = \ln\left(1 + \frac{3h}{4}\right)$$

$$f'\left(\tfrac{4}{3}\right) = \lim_{h \to 0} \frac{f\left(\frac{4}{3}+h\right) - f\left(\frac{4}{3}\right)}{h} = \frac{\ln\left(\frac{4}{3}+h\right) - 2 \cdot \ln(4)}{h}$$