Exercici 1:

a) $f'(x) = 3x^2 \cdot e^x + (1 + x^3) \cdot e^x = (1 + 3x^2 + x^3) \cdot e^x$

b) $f'(x) = \dfrac{\cos x \cdot (1 + e^x) - \sin x \cdot e^x}{(1 + e^x)^2}$

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

d) $f'(x) = -\sin(x - \ln x) \cdot \left(1 - \dfrac{1}{x}\right)$

e) $f'(x) = 121 \cdot (x^3 + 2x^2 + x - 7)^{120} \cdot (3x^2 + 4x + 1)$

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

g) $f'(x) = \dfrac{1}{2 \cdot \sqrt{x + \sqrt{x}}} \cdot \left(1 + \dfrac{1}{2\sqrt{x}}\right)$

Exercici 2:

Les derivades successives de la funció f(x) = ln(1+x) són:

$f'(x) = \dfrac{1}{1 + x}$

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

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

$f^{iv}(x) = \dfrac{-6}{(1 + x)^4}$

$f^{v}(x) = \dfrac{24}{(1 + x)^5}$

$f^{vi}(x) = \dfrac{-120}{(1 + x)^6}$

...

$f^{n)}(x) = \dfrac{(-1)^{n+1} \cdot (n - 1)!}{(1 + x)^n}$