

Dériver une fonction exponentielle

Dériver les fonctions suivantes :

$$\text{a) } f(x) = 4x - 3e^x \quad \text{b) } g(x) = (x - 1)e^x \quad \text{c) } h(x) = \frac{e^x}{x}$$

Correction

$$\text{a) } f'(x) = 4 - 3e^x$$

$$\text{b) } g(x) = (x - 1)e^x = u(x)v(x)$$

$$\text{Avec } u(x) = x - 1 \rightarrow u'(x) = 1 \\ v(x) = e^x \rightarrow v'(x) = e^x$$

$$g'(x) = u'(x)v(x) + u(x)v'(x) \\ = 1 \times e^x + (x - 1)e^x \\ = e^x + xe^x - e^x \\ = xe^x$$

$$\text{c) } h(x) = \frac{e^x}{x} = \frac{u(x)}{v(x)}$$

$$\text{Avec : } u(x) = e^x \rightarrow u'(x) = e^x \\ v(x) = x \rightarrow v'(x) = 1$$

$$h'(x) = \frac{u'(x)v(x) - u(x)v'(x)}{v(x)^2} \\ = \frac{e^x \times x - e^x \times 1}{x^2} \\ = \frac{xe^x - e^x}{x^2} \\ = \frac{e^x(x-1)}{x^2}$$