

$$V(x) = (3x^2 + 4x - 1)e^{-x}$$

$$V(x) = -\frac{d\phi(\vec{B})}{dx} \Rightarrow \phi(\vec{B}) = -\int V(x) dx$$

$$\begin{aligned} \phi(\vec{B}) &= \int (3x^2 + 4x - 1)(-e^{-x}) dx && \left[ \begin{array}{l} \text{integro per} \\ \text{parti} \end{array} \right] \\ &= (3x^2 + 4x - 1)(e^{-x}) - \underbrace{\int (6x + 4)(e^{-x}) dx}_{*} \end{aligned}$$

$$* \int (6x + 4)(-e^{-x}) dx = \left[ \begin{array}{l} \text{ancora per} \\ \text{parti} \end{array} \right]$$

$$= (6x + 4)(e^{-x}) - \int 6e^{-x} =$$

$$= (6x + 4)(e^{-x}) + 6e^{-x}$$

Quindi li unisco:

$$\phi(\vec{B}) = (3x^2 + 4x - 1)(e^{-x}) + (6x + 4)(e^{-x}) + 6e^{-x} + c$$

Raccolgo:

$$\phi(\vec{B}) = (3x^2 + 10x + 9)e^{-x} + c \quad \checkmark$$