

$$(3) y'' - 3y' + 2y = e^x(1-2x)$$

$$\text{HOM: } y'' - 3y' + 2y = 0 \quad \Delta \alpha_1 = x^2 - 3x + 2 \quad \Delta = 1 \quad \text{racines: } \frac{3 \pm 1}{2} = 1, 2$$

$$y_H = Ae^x + Be^{2x} \text{ où } A, B \in \mathbb{R}$$

$$\text{Sol part: } y_2 = (ax + b)e^x = (ax^2 + bx)e^x \quad (\text{car } e^x \text{ est sol de HOM})$$

$$y_2' = (2ax + b)e^x + (ax^2 + bx)e^x = (ax^2 + (2a+b)x + b)e^x$$

$$y_2'' = (2ax + 2a + b)e^x + (ax^2 + (2a+b)x + b)e^x = (ax^2 + (2a+b)x + 2a + 2b)e^x$$

$$y_2'' - 3y_2' + 2y_2 = (ax^2 + (2a+b)x + 2a + 2b - 3ax^2 - (6a+3b)x - 3b + 2ax^2 + 2bx)e^x \\ = (-2ax + 2a - b)e^x = (-2x + 1)e^x$$

$$\Rightarrow \begin{cases} -2a = -2 \\ 2a - b = 1 \end{cases}$$

$$\Rightarrow \begin{cases} a = 1 \\ b = 2a - 1 = 1 \end{cases}$$

$$y_2 = (x^2 + x)e^x$$

$$\text{Sols de l'éq complète: } y = Ae^x + Be^{2x} + (x^2 + x)e^x \text{ où } A, B \in \mathbb{R}$$