

correction interrogatoire

$$1) y' + 4y = 3 \quad \text{--- (1)}$$

La solution est $y(n) = y_H(n) + y_P(n)$

$$y' + 4y = 0 \quad \Leftrightarrow y' = -4y \quad \Leftrightarrow \frac{dy}{dn} = -4y$$

$$\ln |y| = -4n + c \quad / c \in \mathbb{R}$$

$$\frac{dy}{y} = -4 dn$$

$$y_H(n) = k e^{-4n} \quad / k = e^c \in \mathbb{R}$$

$$y_P(n) = k(n) e^{-4n}$$

$$y'_P(n) = k'(n) e^{-4n} - 4 e^{-4n} k(n)$$

on remplace dans (1)

$$(1) : k'(n) e^{-4n} - 4 e^{-4n} k(n) + 4 k(n) e^{-4n} = 3$$

$$k'(n) e^{-4n} = 3$$

$$k'(n) = 3 e^{4n}$$

$$k(n) = \int 3 e^{4n} dn = 3 \int e^{4n} dn = \frac{3}{4} e^{4n} + \alpha$$

$$y_P(n) = \left(\frac{3}{4} e^{4n} + \alpha \right) e^{-4n} = \frac{3}{4} + \alpha e^{-4n} \quad / \alpha \in \mathbb{R}$$

$$y(n) = y_H + y_P$$

$$y(n) = e^{-4n} + \frac{3}{4} \quad \alpha = k + \alpha \in \mathbb{R}$$