$$x^2y' + y = x$$

$$\hat{f}(x) = x^\lambda \sum_{n\geq 0} a_n x^n \ ; \ \lambda \in \mathbb{R} , a_n \in \mathbb{R}$$

on a :

$$\hat{f}'(x) = \left[x^\lambda . (a_0 + a_1 x + a_2 x^2 + \ldots\ldots)\right]'$$

$$\hat{f}'(x) = \lambda x^{\lambda-1} . (a_0 + a_1 x + a_2 x^2 + \ldots\ldots) + x^\lambda . (0 + a_1 + 2a_2 x + 3a_3 x^2 + \ldots\ldots)$$

$$= \lambda x^{\lambda-1} . \sum_{n\geq 0} a_n x^n + x^\lambda \sum_{n\geq 1} n a_n x^{n-1}$$

$$= \lambda x^{\lambda-1} . \sum_{n\geq 0} a_n x^n + x^{\lambda-1} \sum_{n\geq 1} n a_n x^n .$$

$$x^2 . \hat{f}'(x) = \lambda x^{\lambda+1} . \sum_{n\geq 0} a_n x^n + x^{\lambda+1} \sum_{n\geq 1} n a_n x^n$$

$$x^2 . \hat{f}'(x) + \hat{f}(x) = \lambda x^{\lambda+1} . \sum_{n\geq 0} a_n x^n + x^{\lambda+1} \sum_{n\geq 1} n a_n x^n + x^\lambda \sum_{n\geq 0} a_n x^n$$

Scanné avec CamScanner