Centre universitaire de Mila
Faculté des sciences et de technologie
Département de EM et GM

année universitaire 2024/2025
ING GM
Mathématique appliquée

Series N 3

Exercise 1:

Using Lagrange's method, solve the following differential equations:

$7y' + 2y = 4x - 1$

$y' + y = xe^{-x}$

$y' - 2y = \cos(x) + 2\sin(x)$

Exercise 2:

Solve the following differential equations:

$(x + 1)y' + x\,y = x^2 + 2x + 1 \qquad y(0) = 1$

$y' + \tan(t)\,y = \sin(2t) \qquad y(0) = 1 \quad t = \left[0, \frac{\pi}{2}\right[$

$(x^2 + 1)y' + 2x\,y = 3x^2 + 1 \qquad y(0) = 3$

$\sin(x)\,y' - \cos(x)\,y + 1 = 0 \qquad y(0) = 2 \quad x = [0, \pi[$

Exercise 3:

Solve the following differential equations:

$$xy' = y + 1; \quad yy' = -2; \quad xy' = e^y; \quad y' = y + x^2 y^3$$

Exercise 4:

Solve the following differential equations:

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