Equations différentielles

Résoudre sur l'intervalle I proposé les équations différentielles suivantes d'inconnue y(x):

a) $x \ln x \, y' + y = x, \qquad I =]1, +\infty[$

b) $xy' + 3y = \frac{1}{1+x^2}, \qquad I = \mathbb{R}_+^*$

c) $(1-x)^2 y' = (2-x)y, \qquad I =]-\infty, 1[$

d) $x(xy' + y - x) = 1, \qquad I =]-\infty, 0[$

e) $2xy' + y = x^4, \qquad I =]-\infty, 0[$

f) $y' + 2y = x^2 - 3x, \qquad I = \mathbb{R}$

g) $y' + y = \frac{1}{1+2e^x}, \qquad I = \mathbb{R}$

h) $y' \sin x - y \cos x + 1 = 0, \qquad I =]0, \pi[$

i) $(1-x^2)y' - 2xy = x^2, \qquad I =]1, +\infty[, \quad I =]-1, 1[, \quad I =]-1, +\infty[$

j) $|x|y' + (x-1)y = x^3, \qquad I =]-\infty, 0[, \quad I =]0, +\infty[$

k) $xy' = |y-1|, \qquad I = \mathbb{R}$

l) $y' + y = (-2x+2)e^x, \qquad I = \mathbb{R}$

m) $2x(1-x)y' + (1-x)y = 1, \qquad I = \mathbb{R}$

n) $y' - y - \ln x = 0, \qquad I = \mathbb{R}$

o) $2x(1+x)y' + (1+x)y = 1, \qquad I = \mathbb{R}$

p) $(1+x^2)y' + 4xy = 0, \qquad I = \mathbb{R}$

q) $(1+x)y' - xy = 0, \qquad I = \mathbb{R}$

r) $y' + 4y = (x-1)e^x, \qquad I = \mathbb{R}$

s) $-y' - 5y = \sin x - \cos x, \qquad I = \mathbb{R}$

t) $y'' + y' + \frac{1}{2}y = \sin x, \qquad y(0) = y'(0) = 0, \qquad I = \mathbb{R}$

u) $y'' - 2y' + y = 2e^x, \qquad I = \mathbb{R}$

v) $y'' + y = \cos^3 x, \qquad I = \mathbb{R}$

w) $y'' - 2y' + 2y = -3\cos x + 5\sin x, \qquad I = \mathbb{R}$

x) $y'' + 6y' + 9y = e^{2x}, \qquad I = \mathbb{R}$

y) $y'' - 2y' + y = \cosh x, \qquad I = \mathbb{R}$

z) $y'' - 2ky' + (1+k^2)y = e^x \sin x, \qquad I = \mathbb{R}$