PROBLEM SET 25: NONHOMOGENEOUS SECOND-ORDER LINEAR DIFFERENTIAL EQUATIONS

Note: Most of the problems were taken from the textbook [1].

Problem 1. *Solve the differential equations.*

a) $4y'' + 2y' - 8y = 1 - 2x^2$*;*

b) $y'' - 4y' + 4y = x - \sin x$*;*

c) $9y'' + y = e^{2x}$*;*

d) $y'' - 4y' + 5y = e^{-x}$.

Problem 2. *Solve the initial-value problem.*

a) $y'' - 2y' + 5y = \sin x, \quad y(0) = y'(0) = 1$*;*

b) $y'' - y = xe^{2x}, \quad y(0) = 0, \;\; y'(0) = 1$*;*

c) $y'' + y' - 2y = x + \sin 2x, \quad y(0) = 1, \;\; y'(0) = 0.$

References

[1] J. Stewart: *Single Variable Calculus* 8th Edition, Cengage Learning, Boston 2015.