Differential Equations I for Students of Engineering Sciences

Sheet 1 (home)

Exercise 1:

a) Solve the differential equation
$$6y' + 7y = 5$$
by separation of variables and check that the computed function is a solution.

b) Solve the differential equation by variation of constants
$$\dot{y} - 2ty = (6 - 4t)e^{3t}.$$

Exercise 2:

a) Solve the following differential equation by substitution
$$y' = -4xy - xy^2.$$

b) Solve the initial value problem $y' = y^2 + 1$ with $y\left(\dfrac{\pi}{4}\right) = 1$ by separation of variables.

c) Solve the initial value problem $y' = x^3 y^2$ with $y(0) = 4$.

Hand in until: 29.10.2021