Antti Auranen 18.2.2019

# Insinöörimatematiikka D Demot 2019

# Demo 6 19.2.2018

## 5.

$$\begin{aligned} y' = y^2x^3 &<=> \frac{dy}{dx} = y^2x^3 \\ &<=> \frac{1}{y^2}dy = x^3dx \\ &<=> \int \frac{1}{y^2}dy = \int x^3dx + C \\ &<=> -\frac{1}{y} = \frac{1}{4}x^4 + C \\ &<=> y = -\frac{4}{x^4} + C, x \neq 0 \end{aligned}$$

## 6.

$$\begin{aligned} y' = xe^{-4} &<=> e^4dy = xdx \\ &<=> \int e^4dy = \int xdx + C \\ &<=> e^4 = \frac{1}{2}x^2 + C \\ &<=> y = ln(\frac{1}{2}x^2 + C) \end{aligned}$$

## 7.

$$\begin{aligned} y' = (x+1)(y+1) &<=> \frac{dy}{dx} = (x+1)(y+1) \\ &<=> \frac{1}{y+1}dy = (x+1)dx \\ &<=> \int \frac{1}{y+1}dy = \int (x+1)dx + C \\ &<=> ln(y+1) = \frac{1}{2}x^2 + x + C \\ &<=> y + 1 = e^{\frac{1}{2}x^2+x+C} \\ &<=> y = e^{\frac{1}{2}x^2+x+C} \end{aligned}$$