

Inhomogene lineare Differentialgleichungen

$$y'(t) = \frac{4}{1+2t} \cdot y(t) + \underbrace{6 \cdot (1+2t)}_0 \quad t > -\frac{1}{2}$$

① homogene Gleichung lösen $\rightarrow b(t) = 0$

$$y'(t) = \frac{4}{1+2t} \cdot y(t)$$

$$\frac{dy}{dt} = \frac{4}{1+2t} \cdot y(t)$$

$$= \int \frac{1}{y(t)} \cdot dy = \int \frac{4}{1+2t} \cdot dt$$

$$= \ln(|y(t)|) = 2 \cdot \int \ln(1+2t) + c \quad |e$$

$$y(t) = (1+2t)^2 \cdot C \quad (1+2t)^2$$

\Rightarrow Probe:

$$y'(t) = \frac{4}{1+2t} \cdot (1+2t)^2 \cdot C$$

$$y'(t) = \frac{4}{\cancel{1+2t}} \cdot \cancel{(1+2t)} \cdot (1+2t)$$

$$y'(t) = \frac{4}{1+2t} \cdot C$$

② $C \Rightarrow C(t)$

$$y(t) = (1+2t)^2 \cdot C(t) \Rightarrow y(t) = (1+2t)^2 \cdot C(t)$$