$$\text{lin hom } \frac{dy}{dx}\,{}^{x}q + y\,{}^{x}p = 0 \Longrightarrow {}^{x}\mathsf{1} = \exp\left(-\int_{dt}^{x} \frac{{}^{t}p}{{}^{t}q}\right) = C\,{}^{x}\mathsf{1}$$

$$\text{sep } \frac{dy}{y} = -dx\frac{{}^{x}p}{{}^{x}q} \Longrightarrow \log y = -\int dx\frac{{}^{x}p}{{}^{x}q}$$

$${}^{x}\mathsf{1} = \exp\left(-\int_{o}^{x} p/q\right)$$

$${}^{x}\mathsf{1} = \exp\left(-\int^{x} p/q\right) = C\,{}^{x}\mathsf{1}$$

$$\underline{y} = -2xy \Longrightarrow {}^{x}\mathsf{1} = e^{-x^2} \underset{y\,(0)\,=\,4}{\Longrightarrow} {}^{x}\mathsf{1} = 4\,e^{-x^2}$$

continuously compounded interest

$$\begin{cases} \text{initial deposit } 30.000 \\ \text{interest rate } .08 \end{cases} \Longrightarrow \begin{cases} P\,(t) \text{ capital after t years} \\ \text{when P(t)=50.000} \end{cases}$$

$$\begin{cases} V\,(t) = e^{t^{1/3}} \text{ asset value in t years} \\ \text{annual interest rate } .1 \end{cases} \Longrightarrow \begin{cases} \text{present value } V_{\,0}\,(t) \\ \text{when present value maximal} \end{cases}$$