

$$3 \cdot e^{3y} \cdot y' = 2t, \quad y(0) = 1.$$

$$g(y) \cdot y' = h(t),$$

$$\text{kde } g(y) = 3 \cdot e^{3y}, \quad h(t) = 2t$$

$$g \in C(\mathbb{R}), \quad h \in C(\mathbb{R}) \quad \forall y \in \mathbb{R}: g(y) > 0.$$

∃! max. řešení φ zadane' úlohy

$$G(y) = \int 3e^{3y} dy = e^{3y},$$

$$H(t) = \int 2t dt = t^2$$

$$G(y) = H(t) + C, \quad C \in \mathbb{R}$$

$$e^{3y} = t^2 + C, \quad C \in \mathbb{R}$$

$$y(0) = 1 \Rightarrow e^{3 \cdot 1} = 0^2 + C \Rightarrow C = e^3$$

$$e^{3\varphi(t)} = t^2 + e^3 \Rightarrow 3\varphi(t) = \ln(t^2 + e^3)$$

$$\Rightarrow \varphi(t) = \frac{1}{3} \ln(t^2 + e^3) \Rightarrow \underline{\underline{\varphi(t) = \ln \sqrt[3]{t^2 + e^3}}}$$

Formálně: $3 \cdot e^{3y} \cdot y' = 2t$

$$3 \cdot e^{3y} \cdot \frac{dy}{dt} = 2t \quad | dt$$

$$3 \cdot e^{3y} dy = 2t dt \quad \int 3 \cdot e^{3y} dy = \int 2t dt$$

$$e^{3y} = t^2 + C, \quad C \in \mathbb{R}.$$