

$$(1) 2tz + (1+t^2) \cdot y' = 0, \quad (2) y(1) = 6$$

$$M(t,y) = 2tz, \quad N(t,y) = 1+t^2$$

$$\Omega = \mathbb{R}^2, \quad M \in C(\Omega), \quad N \in C(\Omega). \quad \forall (t,y) \in \Omega: 1+t^2 > 0$$

$$\frac{\partial M(t,y)}{\partial y} = 2t = \frac{\partial N(t,y)}{\partial t}.$$

$$\frac{\partial V(t,y)}{\partial t} = 2tz, \quad \frac{\partial V(t,y)}{\partial y} = 1+t^2$$

⇓

$$V(t,y) = t^2 \cdot y + x(y)$$

$$\frac{\partial V(t,y)}{\partial y} = t^2 + x'(y) = 1+t^2 \Rightarrow x'(y) = 1,$$

tedy např. $x(y) = y$. Odtud

$$V(t,y) = t^2 y + y = (t^2 + 1)y$$

$$\varphi: (t^2 + 1)y = 12, \quad y(1) = 6$$

$$\varphi: y = \frac{12}{t^2 + 1}.$$