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

$M(t,y) = 2ty, \qquad N(t,y) = 1+t^2$

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

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

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

$$\Downarrow$$

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

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

tedy např. $\chi(y) = y$. Odtud

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

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

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