

$$y' = \frac{x^2 + y^2}{2xy}$$

$$y' = \frac{x^2(1 + \frac{y^2}{x^2})}{x^2(2\frac{y}{x})} = \frac{1 + (\frac{y}{x})^2}{2(\frac{y}{x})} \quad \left(\begin{array}{l} \text{ENACBA S HOMOGENO} \\ \text{DESNO STRANJO} \end{array} \right)$$

OVDEDELO NOVO SPREHVALJIVKO

$$u = \frac{y}{x} \Rightarrow y = ux \Rightarrow y' = u'x + u$$

$$u'x + u = \frac{1 + u^2}{2u}$$

$$u'x = \frac{1 + u^2}{2u} - u = \frac{1 + u^2 - 2u^2}{2u} = \frac{1 - u^2}{2u} \quad | : (1 - u^2)$$

$$\frac{2u}{1 - u^2} du = \frac{dx}{x} \quad | : (1)$$

$$\int \frac{2u}{u^2 - 1} du = - \int \frac{dx}{x}$$

$$\ln|u^2 - 1| = -\ln|x| + \ln C \quad C > 0$$

$$|u^2 - 1| = \frac{C}{|x|}$$

$$u^2 - 1 = \frac{D}{x} \quad D \neq 0$$

$$\frac{y^2}{x^2} - 1 = \frac{D}{x}$$

$$y^2 - x^2 = Dx$$

$$y^2 = Dx + x^2, \quad D \neq 0$$

ALI JE $y=x$ ($y=-x$) TUDI REŠITEV?

$$y=x \Rightarrow \left. \begin{array}{l} y' = 1 \\ \frac{x^2 + y^2}{2xy} = \frac{x^2 + x^2}{2x^2} = 1 \end{array} \right\} y=x \text{ JE REŠITEV}$$

$$y=-x \Rightarrow \left. \begin{array}{l} y' = -1 \\ \frac{x^2 + y^2}{2xy} = \frac{x^2 + x^2}{-2x^2} = -1 \end{array} \right\} y=-x \text{ JE REŠITEV}$$

$$\begin{array}{l} 1 - u^2 = 0 \\ u^2 = 1 \\ (\frac{y}{x})^2 = 1 \\ y = \pm x \end{array}$$

$$y^2 = Ex + x^2, \quad E \in \mathbb{R}$$