

(a) D.E. DANE DRUŽINE

$$\frac{2x}{a^2} + \frac{2yy'}{4} = 0 \Rightarrow \frac{2x}{a^2} = -\frac{2yy'}{4} \Rightarrow \frac{1}{a^2} = -\frac{yy'}{2x}$$

$$\frac{x^2}{a^2} + \frac{y^2}{4} = 1$$

$$x^2 \cdot \left(-\frac{yy'}{2x}\right) + \frac{y^2}{4} = 1$$

$$-yy'x^2 + y^2x = 4x$$

$$y' = \frac{x(y^2 - 4)}{yx^2}$$

$$y' = \frac{y^2 - 4}{xy}$$

(b) D.E. ORTOG. TRAJEKTORIJ

$$-\frac{1}{y^3} = \frac{y^2 - 4}{xy}$$

$$y' = \frac{xy}{4 - y^2}$$

$$(c) \quad y' = \frac{xy}{4 - y^2}$$

$$\frac{(4 - y^2)}{y} dy = x dx \quad | : y \neq 0 \quad (y = 0 \text{ JE TUDI REŠITEV D.E.)}$$

$$\int \left(\frac{4}{y} - y\right) dy = \int x dx$$

$$4 \ln|y| - \frac{y^2}{2} = \frac{x^2}{2} + c \quad c > 0$$

$$4 \ln|y| = \frac{x^2 + y^2}{2} + c$$

$$\ln|y| = \frac{x^2 + y^2}{8} + \frac{c}{4}$$

$$|y| = e^{\frac{c}{4}} e^{\frac{x^2 + y^2}{8}}$$

$$y = D e^{\frac{x^2 + y^2}{8}}, \quad D \neq 0$$

$$y = E e^{\frac{x^2 + y^2}{8}}, \quad E \in \mathbb{R}$$