$$L = \frac{1}{2} m \left[(\dot{x}' - w y')^2 + (\dot{y}' + w x')^2 \right] + e_0 E_0 x' \quad (3/8)$$

$$\vec{v} = \dot{x}' \hat{\imath}' + \dot{y}' \hat{\jmath}' + \vec{w} \times (x' \hat{\imath}' + y' \hat{\jmath}')$$

$$\begin{vmatrix} \hat{\imath}' & \hat{\jmath}' & \hat{k}' \\ 0 & 0 & w \\ x' & y' & 0 \end{vmatrix} =$$

$$= \hat{\imath}' (-w$$

$$\frac{d}{dt} \frac{\partial L}{\partial \dot{x}'} = \frac{d}{dt} m (\dot{x}' - w y') = \frac{\partial L}{\partial x'} = m (\dot{y}' + w x') w + e_0 E_0$$

$$\frac{d}{dt} \frac{\partial L}{\partial \dot{y}'} = \frac{d}{dt} m (\dot{y}' + w x') = \frac{\partial L}{\partial y'} = m (\dot{x}' - w y') w (-1)$$

$/ : m$

$$\ddot{y}' = -2w \dot{x}' + w^2 y'$$

$$\ddot{x}' = 2w \dot{y}' + w^2 x' + \underbrace{\frac{e_0 E_0}{m}}_{\tilde{e}}$$

2/8

$$\xi = x' + i y'$$

$$\ddot{\xi} = -2w i \dot{\xi} + w^2 \xi + \tilde{e}$$

$$\tilde{\xi} = \xi + \frac{\tilde{e}}{w^2}$$

(da pretvorimo u bolj znano obliko)

$$\tilde{\xi} = e^{-i \Omega t} \qquad \ddot{\tilde{\xi}} = -2w i \dot{\tilde{\xi}} + w^2 \tilde{\xi}$$

...

$\Rightarrow \xi$

I/

$$-\lambda^2 = -2\omega\lambda + \omega^2$$

$$(\lambda-\omega)^2 = 0$$

$$\tilde{\xi} = a \cdot e^{-i\omega t} + bt\, e^{-i\omega t}$$

$$\xi = -\frac{\tilde{e}}{\omega^2} + (a+bt)e^{-i\omega t} \Rightarrow \quad a = \frac{\tilde{e}}{\omega^2}$$ 1/8

$$\xi(t=0) = 0 \qquad \xi = +\frac{\tilde{e}}{\omega^2}\left(e^{-i\omega t} - 1\right)$$

$$\dot{\xi}(t=0) = b\, e^{-i\omega t} + bt(-i\omega)\, e^{-i\omega t} + a\, e^{-i\omega t}(-i\omega)$$

$$b + a(-i\omega) = 0$$

$$b = i\omega \frac{\tilde{e}}{\omega^2}$$

$$\xi(t) = \frac{\tilde{e}}{\omega^2}\left(-1 + e^{-i\omega t} + i\omega t\, e^{-i\omega t}\right)$$

$$x + iy = \xi / e^{-i\omega t} = \frac{\tilde{e}}{\omega^2}\left(1 - e^{+i\omega t} + i\omega t\right)$$ 1/8

$$\left.\begin{aligned} x &= \frac{\tilde{e}}{\omega^2}(1 - \cos\omega t) \\ y &= \frac{\tilde{e}}{\omega^2}(-\sin\omega t + \omega t) \end{aligned}\right\} \text{cikloida!}$$ 1/8