$\Rightarrow$ dal termine $\alpha$ a $\hat{e}_\theta$ (più semplice)

$$-\frac{\omega_0^{\cancel{3}\,2} r_0^2 w}{\cancel{8}\,4\, v^2 (1+\omega_0 t)^{\cancel{2}}} + \frac{\cancel{\omega_0} r_0 v}{\cancel{2}\rho \sqrt{1+\omega_0 t}} = \frac{w \cancel{\omega_0}}{\cancel{2}\cancel{(1+\omega_0 t)}}$$

$$\frac{r_0 v \sqrt{1+\omega_0 t}}{\rho} = w \left[ 1 + \frac{\omega_0^2 r_0^2}{4 v^2 (1+\omega_0 t)} \right]$$

$$\rho = \frac{r_0 v \sqrt{1+\omega_0 t}}{w \; \frac{4 v^2 (1+\omega_0 t) + \omega_0^2 r_0^2}{4 v^2 (1+\omega_0 t)}}$$

$$= \frac{4 r_0 v^3 (1+\omega_0 t)^{3/2}}{w \left[ \omega_0^2 r_0^2 + 4 v^2 (1+\omega_0 t) \right]} .$$

Facciamo alcuni controlli:

$$[\rho] = \frac{[L] \cancel{[L]^3} \cancel{[T]^{-3}}}{\cancel{[L]}\cancel{[T]^{-1}} \cancel{[L]^2} \cancel{[T]^{-2}}} = [L] \quad \checkmark$$

Se $b \to 0$ $\quad r(t) = r_0 = \text{cost}.$ $\quad \dot{\theta} = \frac{w}{r_0} = \text{cost} \Rightarrow$ ho moto circ. uniforme.

$b \to 0 \Rightarrow \omega_0 = 0$, $v = w$ $\quad \Rightarrow \quad \rho = \frac{\cancel{4} r_0 \cancel{w^3}}{\cancel{w}\,\cancel{4}\,\cancel{w^2}} = r_0 \quad \checkmark$

$$\hat{T} = \hat{e}_\theta \; ; \quad \hat{N} = -\hat{e}_r \quad \checkmark$$