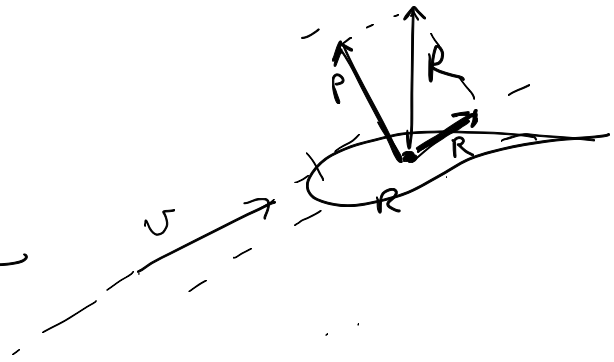
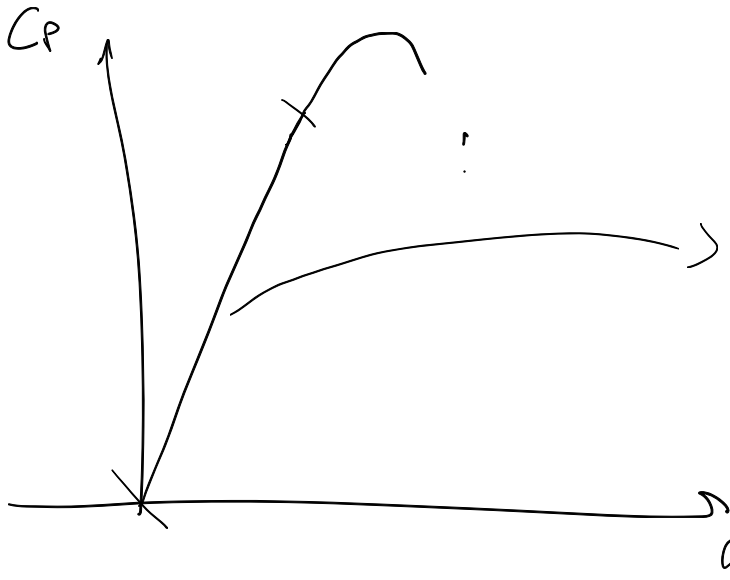
COEFFICIENTI AERODINAMICI

$$C_p = \frac{P}{\frac{1}{2}\rho V^2 S}$$

$$C_R = \frac{R}{\frac{1}{2}\rho V^2 S}$$





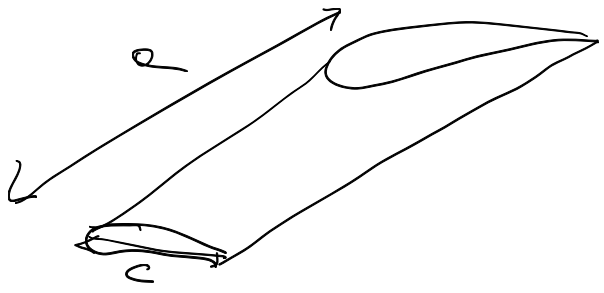
$$C_p = C_{p'_\infty}\,\alpha$$

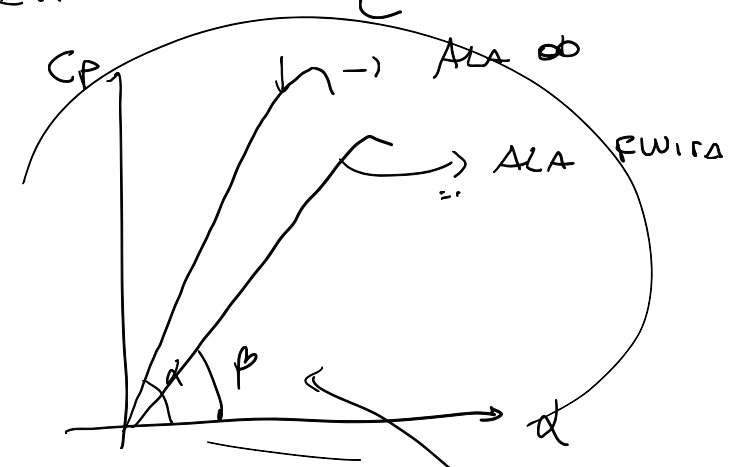
$$C_{p'_\infty} = 5.73$$

$\Rightarrow$ ALA LUNGHEZZA FINITA, con λ

ALLUNGAMENTO ALARE $\lambda = \frac{e}{c}$

RAPPORTO di ASPETTO





$$\frac{\tan\alpha = C_{p'_\infty} = 5.73}{\tan\beta = C_p'}$$

RESISTENZA INDOTTA

$$C_{R_i} = \frac{C_p^2}{\lambda\pi}$$

$\Leftarrow$

$$C_p' = \frac{C_{p'_\infty}}{1 + \frac{C_{p'_\infty}}{\pi\lambda}} \qquad < C_{p'_\infty}$$

$$C_p = C_p' \cdot \alpha$$

ALA ELLITTICA

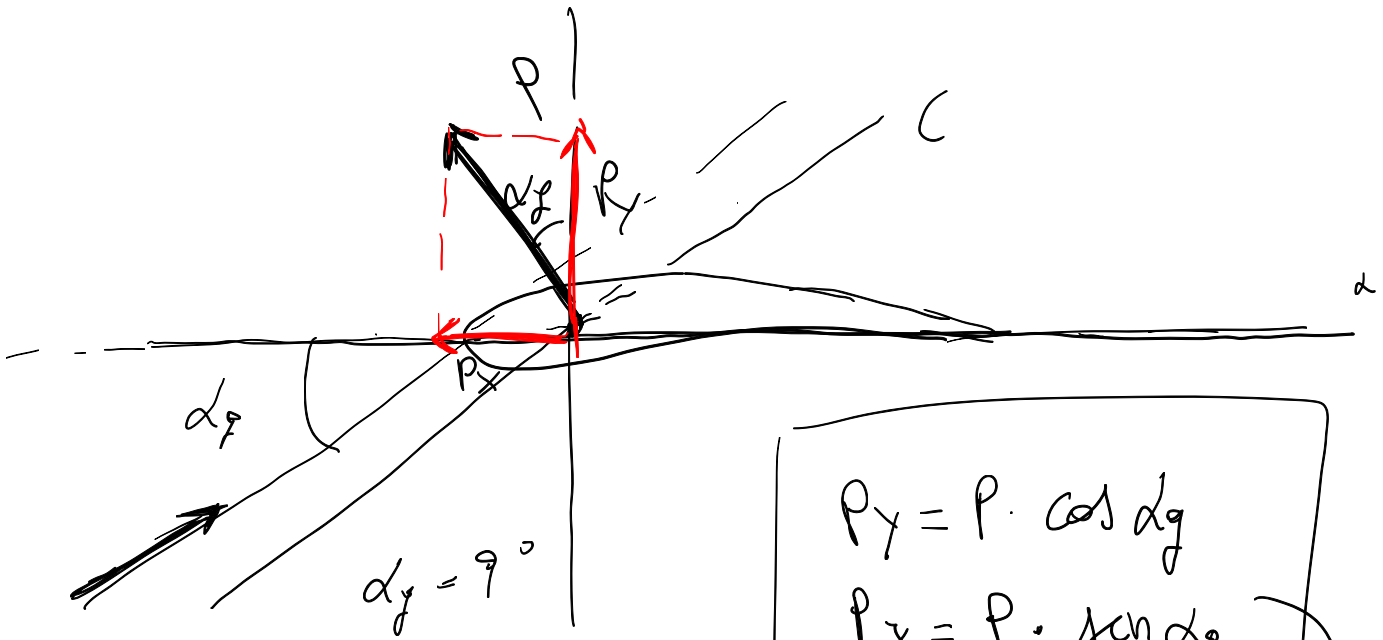
C_p' COEFFICIENTE ANGOLARE DI PORTANZA

Se l'ala non ellittica devo considerare

$$\lambda_{eff} = \lambda \cdot \mu \qquad \mu \sim 0.9$$

↓ COEFFICIENTE CORRETTIVO

RESISTENZA TOTALE: $\boxed{C_R = C_{R0} + \frac{C_p^2}{\pi \lambda}}$



$$P_y = P \cdot \cos \alpha_g$$
$$P_x = P \cdot \sin \alpha_g$$

$$\alpha_a = \alpha_g + \alpha_0 = 12° \cdot \frac{2\pi}{360°} = 0.209 \text{ rad}$$

$$\lambda_{eff} = \lambda \cdot \mu = 11.4$$

$$C_p' = \frac{C_{p\infty}'}{1 + \frac{C_{p\infty}'}{\pi \lambda_{eff}}} = 4.94$$

$$C_{p\infty}' = 5.73$$

$$C_p = C_{p\infty}' \cdot \alpha_a$$

P ALA INFLUITA

$$C_p = C_p' \cdot \alpha_a = 1.03$$

$$P = C_p \cdot \frac{1}{2} \rho U^2 S =$$

$$= 2{,}20 \cdot 10^4 \text{ N}$$