Two different wings have the following spans and circulation distributions:

i) $b = 15$, $A_1 = 0.0400$, $A_3 = 0$, $A_5 = 0$
ii) $b = 16$, $A_1 = 0.0352$, $A_3 = -0.0055$, $A_5 = 0.0011$

All other $A_n$’s are zero. Both wings are operating at the same $V_\infty = 1$ and $\rho = 1$.

a) Determine the lift distribution $L'(y)$ for each wing. Plot both $L'$ versus $y$ on the same graph.

b) Determine the induced-angle distribution $\alpha_i(y)$ for each wing. Plot both on the same graph.

c) Determine the lift $L$, induced drag $D_i$, and the span efficiency $e$ for each wing. Which wing appears to be better from the engine’s point of view?

d) Comment on the validity of the validity of the following statement:
   “An elliptically-loaded wing is optimum for minimum induced drag”