F2a. Use Profili or Xfoil to compute the "exact" inviscid $c_l(\alpha)$ curves for the following airfoils, over the range $\alpha = 0° \ldots 10°$:

1) NACA 0010

2) NACA 0020

Also determine $c_\ell(\alpha)$ using thin airfoil theory for:

3) Zero-camber airfoil

Plot all three curves superimposed. Are the panel results and thin airfoil theory results consistent? Explain.

F2b. Use Profili or Xfoil to compute the following three polars for the NACA 0010 airfoil, for $\alpha = 0° \ldots 14°$:

1) Inviscid

2) Viscous at $Re = 10^6$

3) Viscous at $Re = 10^5$

Plot the $c_\ell(c_d)$ drag polars and the $c_\ell(\alpha)$ curves overlaid, and comment on the validity of the inviscid approximation.