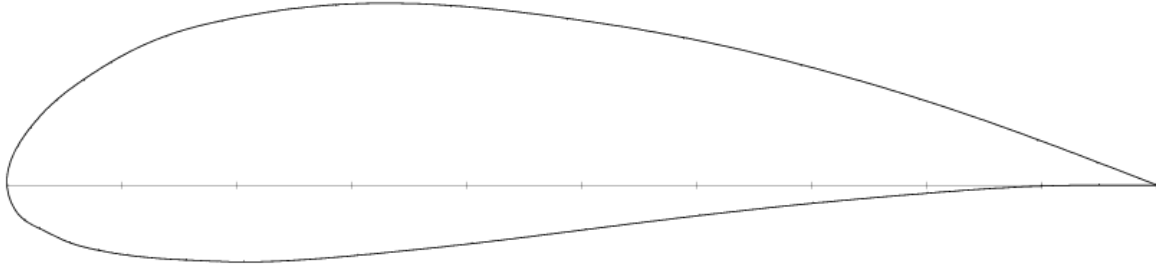


AEM 313 Problem Set #4

Due: 25th September 2017

1. For the GOE522 given below, use the Joukowski airfoil theory (Lesson 11) to estimate:



- The zero lift angle of attack. $\alpha_{z_l} = \alpha(C_l = 0) =$
 - The lift coefficient at zero angle of attack ("Cee Ell Nought"). $C_{l_0} = C_l(\alpha = 0) =$
 - The slope of the lift curve ("Cee Ell Alpha"). $C_{l_\alpha} = \frac{dC_l}{d\alpha} =$
 - The quarter chord moment coefficient ("Cee Em quarter chord"). $C_{m_{\frac{c}{4}}} =$
2. A spinning cylinder of radius 4 inches and span of 48 inches is generating 10 lbf of lift in a 100 ft/s flow at SSL.
 - Determine the equivalent streamfunction (composed of a freestream, doublet and vortex). $\psi(r, \theta) =$
 - Plot streamlines.