AERODYNAMICS (AER)
Lesson 2 – Part 1: Inviscid Flow – 2D Potential Flow of Ideal Liquid

EXAM 2014-15Q1

Fig. 1, Fig. 2 and Fig. 3 show the lift coefficient distributions vs. the dimensionless chord for three different airfoils. The chord is 1.2 m in all cases. Compute for each airfoil:

1. **(3 points)** the airfoil global lift coefficient, c_l
2. **(3 points)** the position of the pressure centre, x_{cp} (as a % of the chord)
3. **(3 points)** the pitching moment coefficient respect to the aerodynamic centre, c_{mca}
4. **(1 points)** in view of the previous results, which airfoil has the strongest tendency to dive? (correct answer adds 1 point, incorrect answer subtracts 1 point)

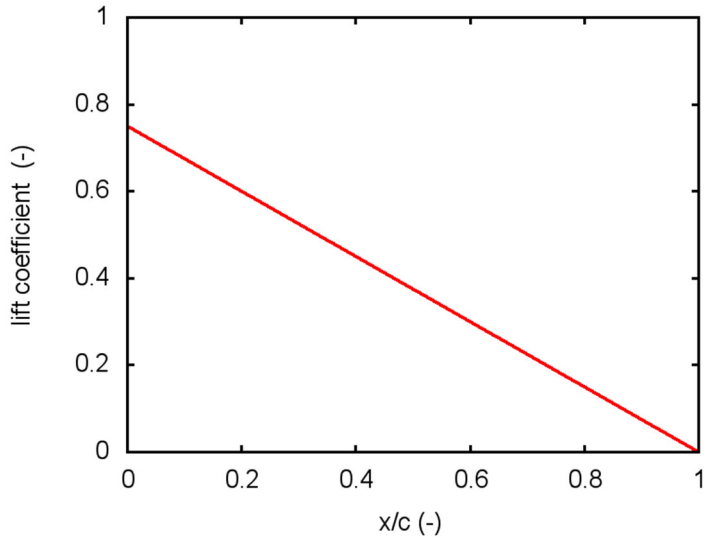

Fig. 1 Lift coefficient distribution vs. dimensionless chord for airfoils #1 (c_l (0) = 3/4).

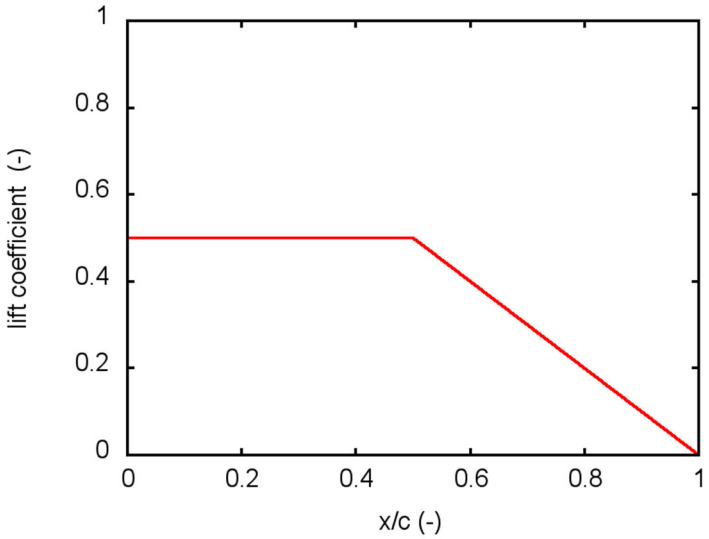

Fig. 2 Lift coefficient distribution vs. dimensionless chord for airfoils #2 (c_l (0) = 1/2).

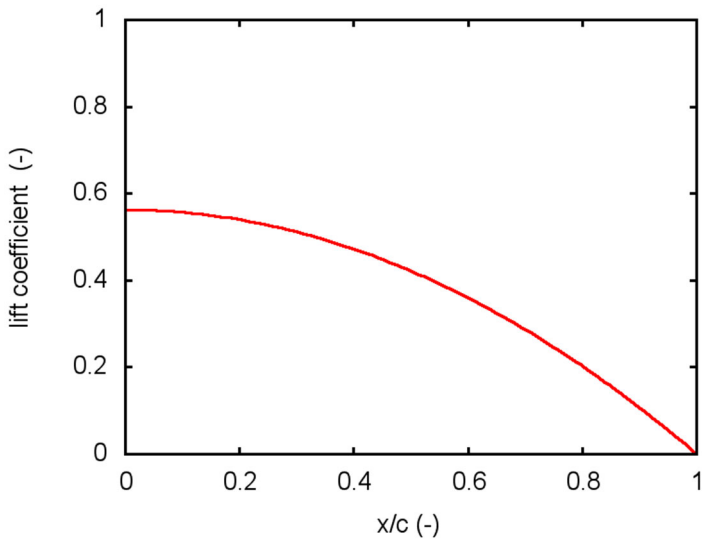

Fig. 3 Parabolic lift coefficient distribution vs. dimensionless chord for airfoil #3 (c_l (0) = 9/16).