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 ($c_l(0) = 9/16$).