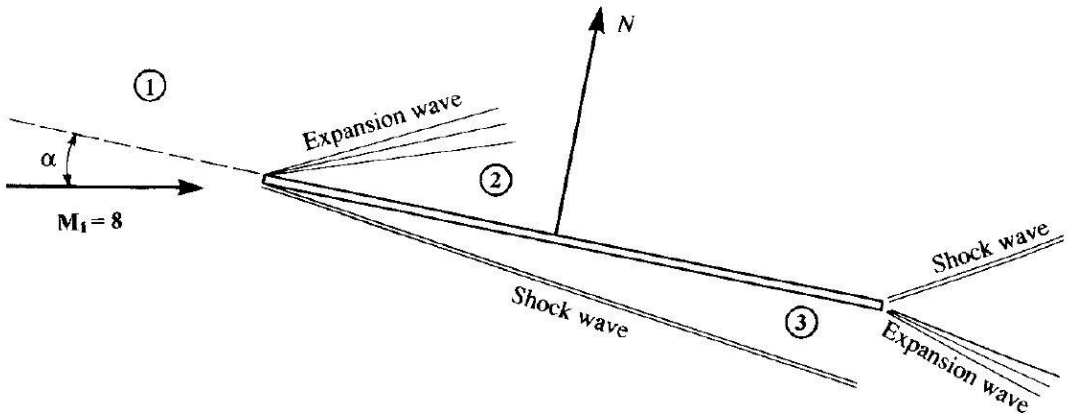
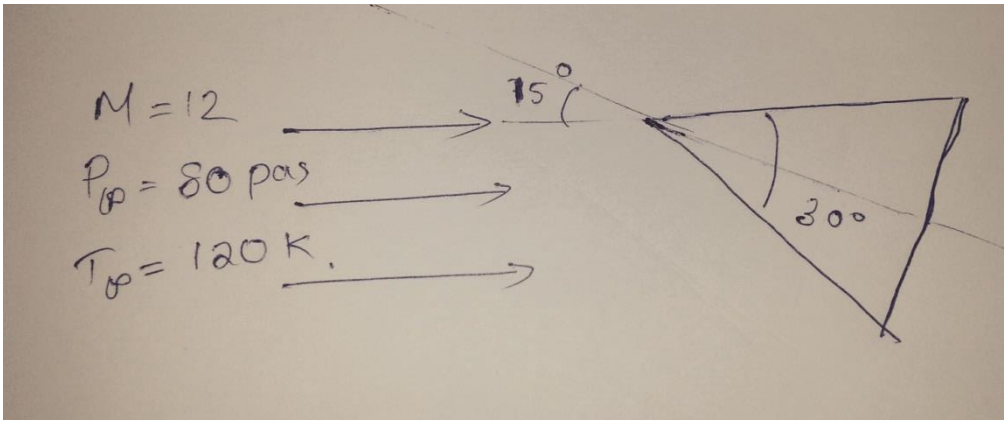
AE 624 Tutorials -3

Questions

1) Consider an infinitely thin flat plate at an angle of attack of 15 deg in a Mach 8 flow. Assume inviscid flow. Calculate the pressure coefficients on the top and bottom surface of the plate, the lift and drag coefficients, and the lift-to-drag ratio using a) exact shock-wave and expansion-wave theory and b) Newtonian theory. Compare the results.



2) Find the drag on the below wedge (base height-1m) using Newtonian theory



3) Find the C_D for circular cylinder using Newtonian Approximation.

4) Find the C_D for hemisphere using Newtonian Approximation and then find the drag for sphere flying at Mach 10, using Newtonian Approximation, T_{infi} -200K , P_{infi} -120 pa, Radius =1m.

5) Find the C_D for cone (Θ_c) using Newtonian Approximation.