

In the Name of God

HW Conical Flow

Deadline: 19/2/1394

Consider a 10 half-angle cone at zero angle of attack travelling at $M_1 = 2.5$ in air with free stream conditions $p_1 = 1$ [atm] and $T_1 = 300$ [K]. Using the conical flow charts, calculate:

- a) the shock angle,
- b) p , T , ρ , M immediately behind the shock,
- c) p , T , ρ , M on the cone surface,
- d) The M_1 below which the flow is detached for this cone.
- e) Compare the surface temperature and pressure for this cone with a wedge with the same half-angle and upstream condition.
- f) Solve Taylor-Maccoll equation and plot Mach number distribution. Check obtained Mach number on the cone surface with that of (c).