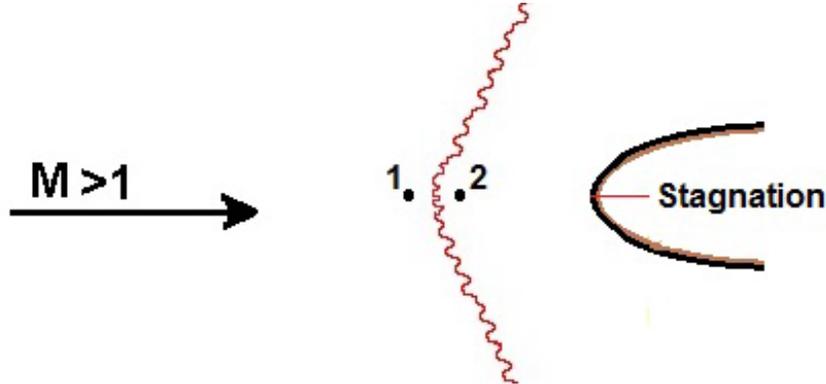


Solution to Problem 3040A:

Between upstream and the stagnation point, the flow must proceed through a normal shock wave:



From the shock wave table, if $M_1 = 4$ then $M_2 = 0.435$ and $p_2/p_1 = 18.5$. Between the point 2 downstream of the shock and the stagnation point (p_0) the flow is isentropic. From the isentropic flow table if $M = M_2 = 0.435$ then $p/p_0 = 0.89$ where p_0 is the stagnation pressure. Then

$$\frac{\text{Stagnation Pressure}}{\text{Upstream Pressure}} = \frac{18.5}{0.89} = 20.8 \quad (1)$$