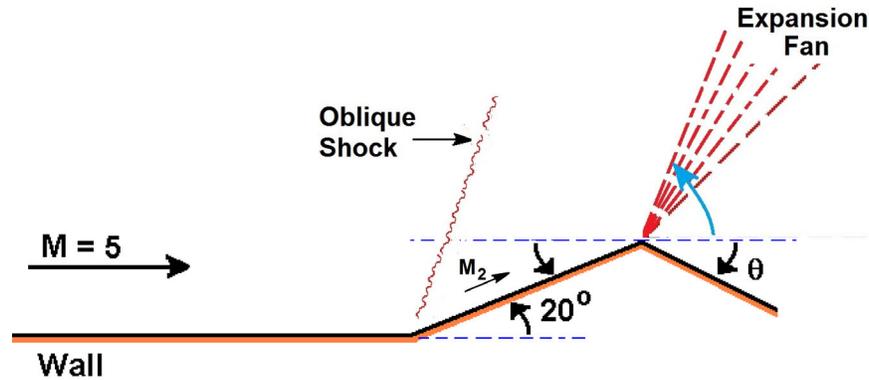


**Solution to Problem 352A:**



Using the oblique shock graph with  $M = 5$  and  $\theta = 20^\circ$ , the oblique shock inclination to the horizontal is  $\beta = 30^\circ$ . Then  $M_1 \sin \beta = 5 \sin 30^\circ = 2.5$ . Then using the shock wave table,  $M_2 \sin (\beta - \theta) = 0.513$  and hence  $M_2 = 2.95$ .

Now consider the Prandtl-Meyer expansion fan with the upstream Mach number  $M_2 = 2.95$ . From the Prandtl-Meyer function graph or table, it follows that  $\nu(M_2) = 48.8^\circ$ . Therefore the maximum angle of turn at the vertex is  $130.5^\circ - 48.8^\circ = 81.7^\circ$  and therefore the maximum value of  $\theta$  for which the flow would remain attached is  $\theta = 81.7^\circ - 20^\circ = 61.7^\circ$ .