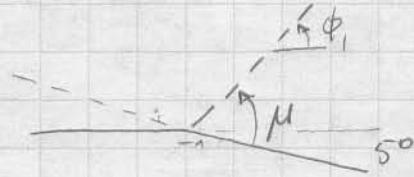


a) At ①: $M_1 = 1.1$, $\nu_1 = 1.336^\circ$

At ②: $\nu_2 = \nu_1 + \theta = 6.336^\circ \rightarrow M_2 = 1.31$ (inverse of $\nu(M_2) = 6.3^\circ$)

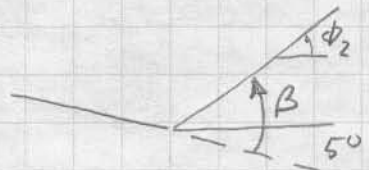
b) For $M = M_2 = 1.31$, $\mu = 49.7^\circ$

$\phi_1 = \mu - 5^\circ = 44.7^\circ$



For $M = M_2 = 1.31$, $\theta = 5^\circ \rightarrow \beta = 59^\circ$ (shock chart)

$\phi_2 = \beta - 5^\circ = 54^\circ$

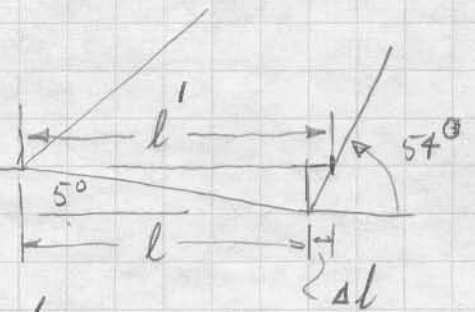


c) First get horizontal base l of region:

$\Delta h = \frac{\Delta h}{\tan 54^\circ} = \frac{l \sin 5^\circ}{\tan 54^\circ} = 0.0633 l$

$l' = l + \Delta l = 1.0633 l$

$\Delta h' = l \sin 5^\circ = 0.087 l$



$l' = \frac{h'}{\tan \phi_1} - \frac{h'}{\tan \phi_2} \rightarrow h' = l' \left(\frac{1}{\tan \phi_1} - \frac{1}{\tan \phi_2} \right)^{-1} = 3.52 l' = 3.74 l$

$h = h' + \Delta h = 3.74 l + l \sin 5^\circ = 3.83 l$

$\frac{h'}{\tan \phi_1} = 3.78 l$, $\frac{h'}{\tan \phi_2} = 2.72 l$

