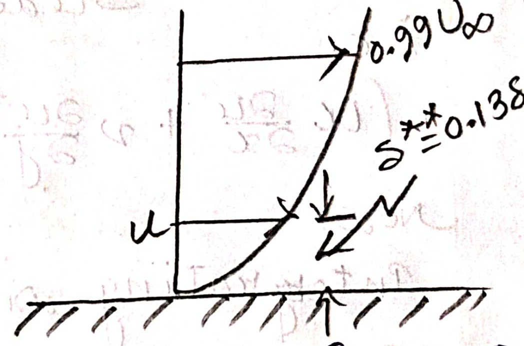
Substituting the values of $\left(\frac{u}{U_\infty}\right)$ and η from eq^{n}s (5) and 7(a) into equation (i)

$$\delta^* = \sqrt{\frac{\nu x}{U_\infty}} \int_0^\infty (1-f')\,d\eta = \sqrt{\frac{\nu x}{U_\infty}} \lim_{\eta\to\infty} [\eta - f(\eta)]$$

$$= 1.7208\sqrt{\frac{\nu x}{U_\infty}} = \frac{1.7208x}{\sqrt{Re_x}} \rightarrow (ii)$$

* **Momentum Thickness (δ^{**}):-**

It is defined as the loss of momentum in the boundary layer as compared with that of potential flow.



$$\rho U_\infty^2 \delta^{**} = \int_0^\infty \rho u (U_\infty - u)\,dy$$

$$\Rightarrow \delta^{**} = \int_0^\infty \frac{u}{U_\infty}\left(1 - \frac{u}{U_\infty}\right) dy \rightarrow (iii)$$

Putting the value of $\frac{u}{U_\infty}$ and η from equations (5) & 7.(a)

$$\delta^{**} = \sqrt{\frac{\nu x}{U_\infty}} \int_0^\infty f'(1-f')\,d\eta$$

$$= 0.664\sqrt{\frac{\nu x}{U_\infty}}$$

$$= \frac{0.664x}{\sqrt{Re_x}} \rightarrow (iv)$$

Velues of the velocity profile shape

$f'(\eta) = \frac{u}{U_\infty} = G$ and $f''(\eta) = H$

Table: The Blasius Velocity Profile $G = \frac{u}{U_\infty}$ and H

η	f	G	H
0	0	0	0.33206
0.2	0.00664	0.006641	0.33199
0.4	0.02656	0.13277	0.33147
0.8	0.10611	0.26471	0.32739
1.2	0.23795	0.39378	0.31659
1.6	0.42032	0.51676	0.29667
2.0	0.65003	0.62977	0.26675
2.4	0.92230	0.72899	0.22809
2.8	1.23099	0.81152	0.18401
3.2	1.56911	0.87609	0.13913
3.6	1.92954	0.92333	0.09809
4.0	2.30576	0.95552	0.06424
4.4	2.69238	0.97587	0.03897
4.8	3.08534	0.98779	0.02187
5.0	3.28329	0.99155	0.01591
8.8	7.07923	1.00000	0.00000