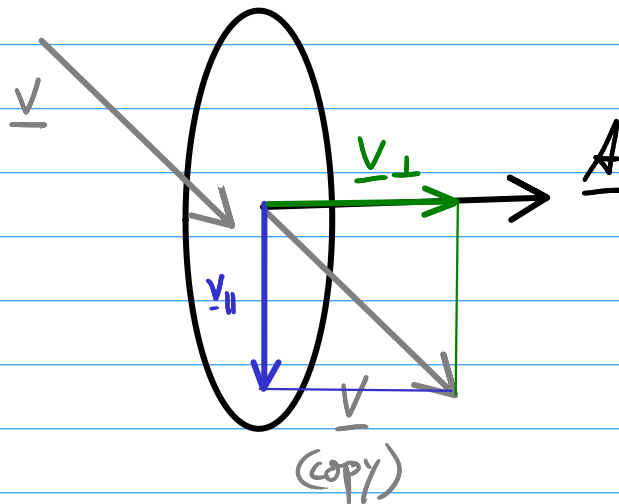


Fluid Dynamics, Lecture Notes, Chap. 4, p. 7

$$\dot{V} = \underline{v} \cdot \underline{A}$$

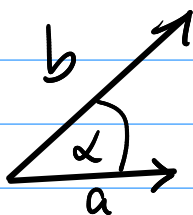


$$\underline{v} = \underline{v}_{\parallel} + \underline{v}_{\perp}$$

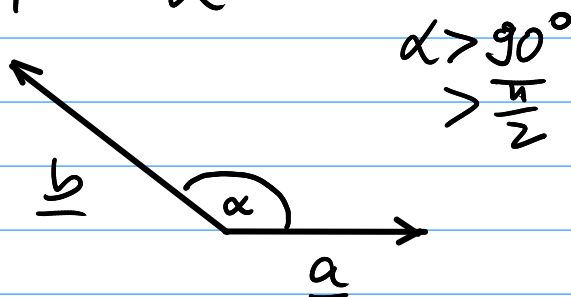
$$\begin{aligned} \dot{V} &= \underline{v} \cdot \underline{A} = (\underline{v}_{\parallel} + \underline{v}_{\perp}) \cdot \underline{A} \\ &= \underline{v}_{\parallel} \cdot \underline{A} + \underline{v}_{\perp} \cdot \underline{A} \\ &= 0 + v_{\perp} A \end{aligned}$$

Chap. 4, p. 10 & 15: sign of dot product

$$\underline{a} \cdot \underline{b} = |\underline{a}| |\underline{b}| \cos \alpha$$



$\alpha < 90^\circ$
 $< \frac{\pi}{2}$



$\alpha > 90^\circ$
 $> \frac{\pi}{2}$

