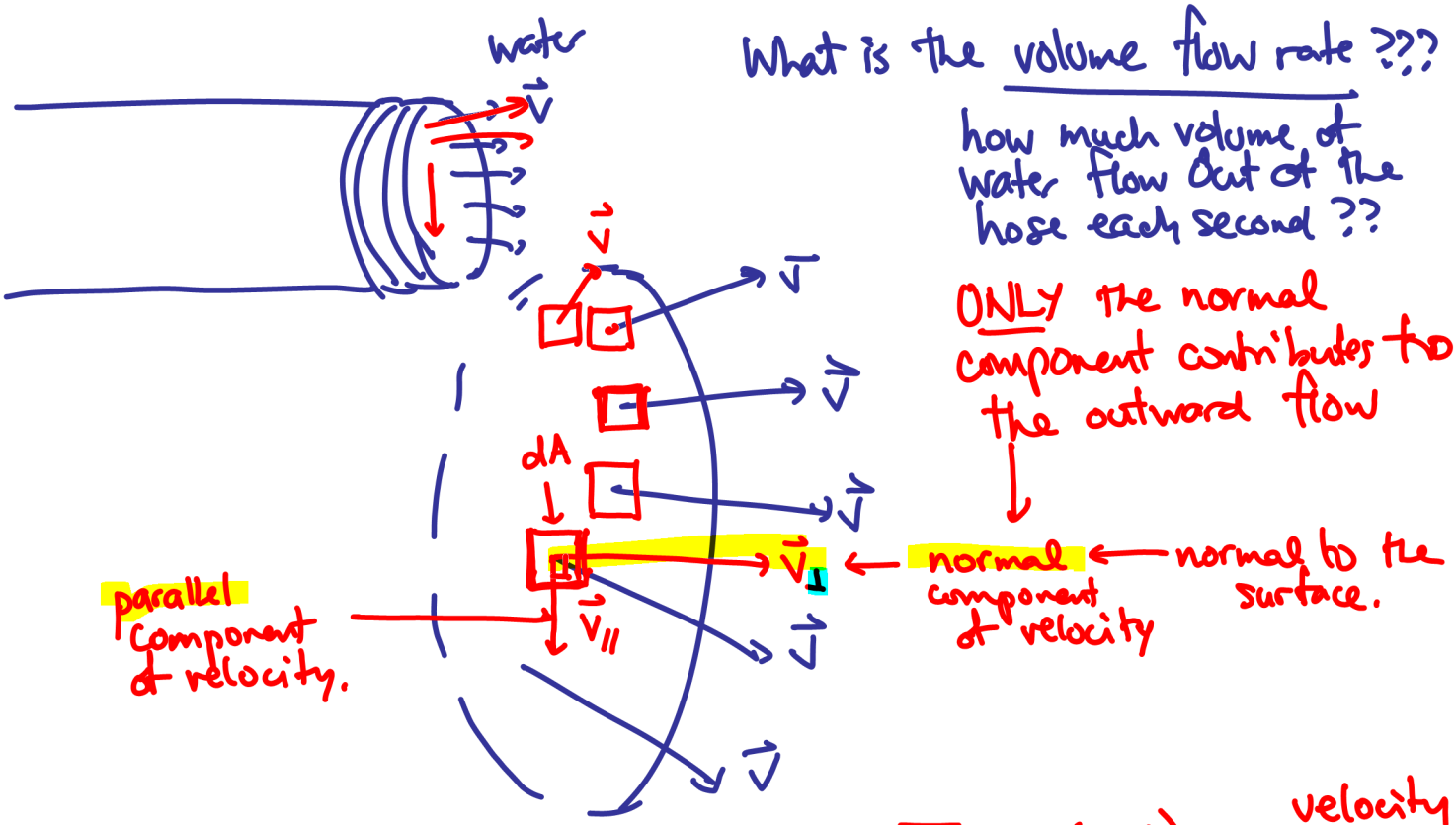
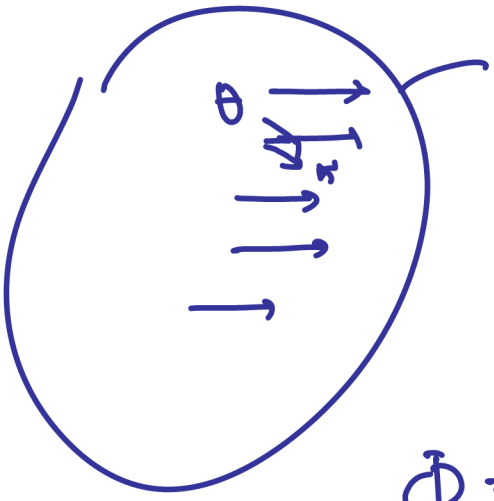



What is the volume flow rate ???

how much volume of water flow out of the hose each second ??

ONLY the normal component contributes to the outward flow

total flow $\rightarrow$ $\sum d\vec{A} \cdot \vec{v}_\perp$ $\rightarrow$ $\sum_{} d\vec{A} \cdot (\vec{v} \cdot \hat{n})$ $\leftarrow$ velocity flux




if all the velocities are the same then the flux is just $\rightarrow$ $\Phi = (\vec{v} \cdot \hat{n}) A$

area of the hose

velocity vector

direction normal to the surface

$\Phi = |\vec{v}| A \cos\theta$

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$\rightarrow$ I can replace $\vec{v}$ with any vector quantity.

magnetic flux $\rightarrow$ $\boxed{\Phi_m = BA\cos\theta}$