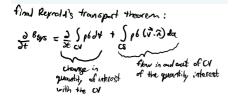


## mechanics Cheat Sheet

by Pamsj10 via cheatography.com/196052/cs/41168/

Linear momentum - mass system	
Reynold's Theorem: the bridge. Mass system to control volume. Lagrang to Eulerian	if t=t: Bsys=Bcv, CV=Sys, occupy the same space
extensive quatities (B): depend on the size of the region. If $B=m$ then b = 1 If $B=\square$ $\square v$ then b = $v$	if t=t + $\Delta$ t, Bsys $\neq$ Bcv, Cv $\neq$ Sys, we use Reynolds here.
intensive quantities (b): independent of the size	Flow rate: Q=Av, if p is constant→mass flow rate

## Reynolds formula



when a moving CV we have w as the relative velocity. w= vbvcs1

## Forces acting on fluids

 $\sum \vec{\hat{f}}_{Sudy} = \int\limits_{CV} \rho f \ dV : \text{Act on each element with the body/fluid, applied to the whole control volume} \\ \sum \vec{\hat{f}}_{Sudy} = \int\limits_{CV} \rho f \ dV : \text{Act on each element or the control surface (thres comes from the bolance of linear momentum)}$ 

 $dP/dt=\Sigma Fsys=\Sigma Fcv$ , where P=mv:momentum

## How to set up a cv problem

whats To draw CV: we happening, think of where you biserts-cut into 2 parts are we trying to solve.

In volume: be Accummulawithin the tion? In which boundaries of integral are we CV. Area looking. Does the quality act integral: must on the surface. bisect the Align the flow boundaries/surface of with dirt vector,  $\mathsf{CV}$ 

mass vs linear momentum

Balance of Balance of Mass: Linear Finding flow Momentum: rates, the Finding relatshs relationship btnw flow properties and velocities and areas. forces. Vector. (-Scalar. (-/+) /+) from scalar from scalar product or direct product of vector quantities

B of mass in B of linear momentum problems to find unknown.



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