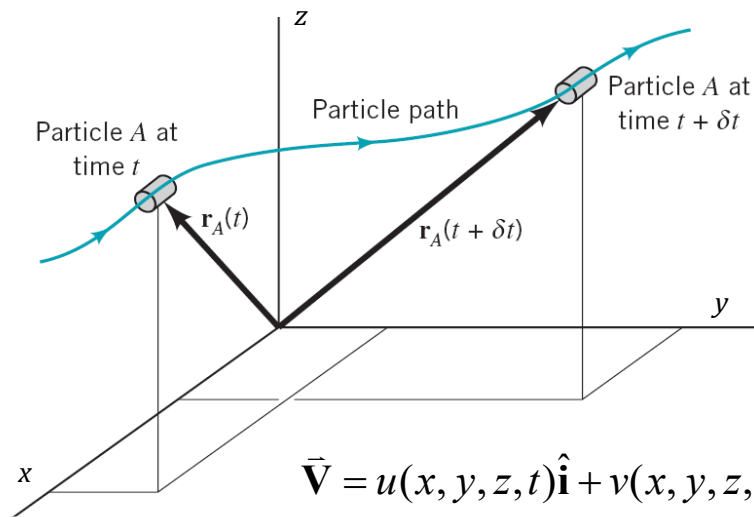


(KEY CONCEPT) [B-1-5]



Acceleration field (as a substantial derivative of a cartesian velocity field):

$$\begin{aligned}\frac{D\vec{V}}{Dt} &= \frac{\partial \vec{V}}{\partial t} + (\vec{V} \cdot \nabla)\vec{V} \\ &= \frac{\partial \vec{V}}{\partial t} + u \frac{\partial \vec{V}}{\partial x} + v \frac{\partial \vec{V}}{\partial y} + w \frac{\partial \vec{V}}{\partial z}\end{aligned}$$

Flow field sketch (source: Munson, Young, & Okiishi "Fundamentals of Fluid Mechanics" 2017)

Lined area for notes, consisting of multiple horizontal dashed lines.