

(EXAMPLE) [B-1-2]

Starting from the differential form of the x-momentum equation:

$$\frac{\partial(\rho u)}{\partial t} + \nabla \cdot (\rho u \vec{V}) = -\frac{\partial p}{\partial x} + \rho f_x + (f_x)_{\text{viscous}}$$

Derive the substantial derivative form of the x-momentum equation:

$$\rho \frac{Du}{Dt} = -\frac{\partial p}{\partial x} + \rho f_x + (f_x)_{\text{viscous}}$$

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