Homework questions

Momentum questions:

\[ 0 = \frac{d}{dt} \int_{C_v} p \, dV + \int_{C_s} p \mathbf{v} \cdot d\mathbf{A} \]

New in mom it's:

\[ F_x = \frac{d}{dt} \int_{C_v} u \, p \, dV + \int_{C_s} u \mathbf{p} \mathbf{v} \, d\mathbf{A} \]

\[ \begin{align*}
E_{f_x} &= \frac{d}{dt} \int_{C_v} u \, p \, dV + \int_{C_s} u \mathbf{p} \mathbf{v} \, d\mathbf{A} \\
F_y &= u - v \\
F_z &= w
\end{align*} \]

\[ \text{Easier than mass coz} \]

\[ 3x \]

\[ U \text{ is in eq} \]

\[ u \mathbf{p} \mathbf{v} \cdot d\mathbf{A} \]

\[ 1000 \text{ kg/m}^3 \]

\[ \text{speed} = 1.414 \text{ m/s} \]

\[ \mathbf{v} = 1 \text{ m/s} \hat{i} - 1 \text{ m/s} \hat{j} \]

\[ \text{Speed} \]

\[ \text{area A} \]

\[ \text{density} \]

\[ \int_{C_s} p \mathbf{v} \cdot d\mathbf{A} = p \mathbf{v} A \]

\[ \int_{C_s} u \mathbf{p} \mathbf{v} \cdot d\mathbf{A} = v \cos \theta \cdot p \mathbf{v} A \]
\[ F_x \] - solids
pressures
shear forces
body forces

unsteady hardest part... coming

another complication

\[ U_{xyz} \]

relative velocity?

on ground test vs engine @ steady flight speed

aircraft

vs aircraft on runway with zero wheel friction