Big Ideas: Fluid Dynamics - Differential Form of Momentum Conservation

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Pressure Force

Check Your Understanding
1 point possible (graded)

The **net** pressure force on an infinitesimal fluid particle in the y direction is proportional to:

- p
- $\frac{\partial p}{\partial x}$
- $\frac{\partial p}{\partial y}$
- $\frac{\partial^2 p}{\partial y^2}$

Viscous Forces

Check Your Understanding
Select true or false.

The net viscous force on the infinitesimal fluid particle in the y direction is proportional to $\left(\frac{\partial \tau_{xy}}{\partial x} + \frac{\partial \tau_{yy}}{\partial y}\right)$

- True
- False

Viscous Forces for Newtonian Fluid

Acceleration

Governing Equations in Differential Form

Check Your Understanding

Select the option that best describes the physical meaning of the following term in the momentum equation: $v\frac{\partial v}{\partial y}$

- Acceleration of an infinitesimal particle in the **x** direction due to motion in the **x** direction
- Acceleration of an infinitesimal particle in the **x** direction due to motion in the **y** direction
- Acceleration of an infinitesimal particle in the **y** direction due to motion in the **x** direction
- Acceleration of an infinitesimal particle in the **y** direction due to motion in the **y** direction

Go to Step 4: Integral Form of Conservation Equations

Go to all (FLUENT) Learning Modules