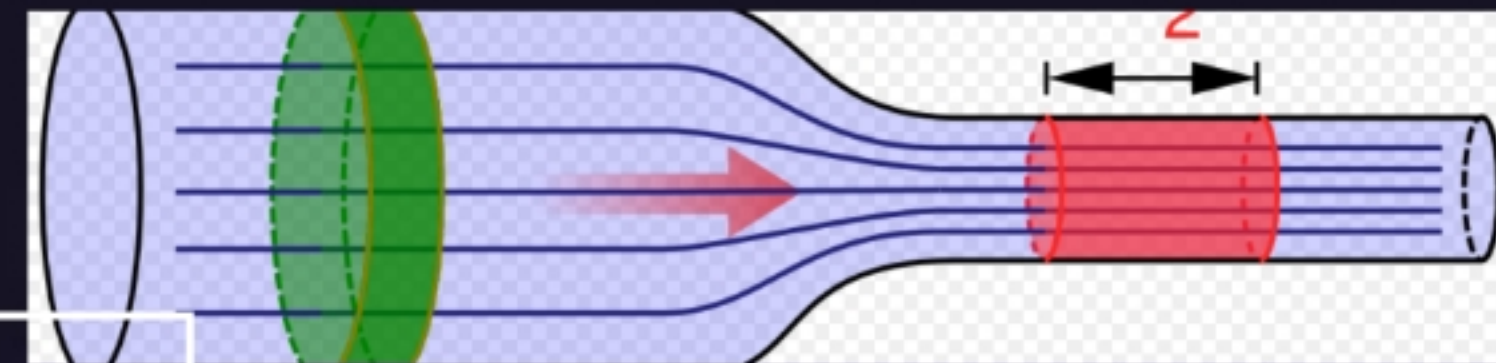
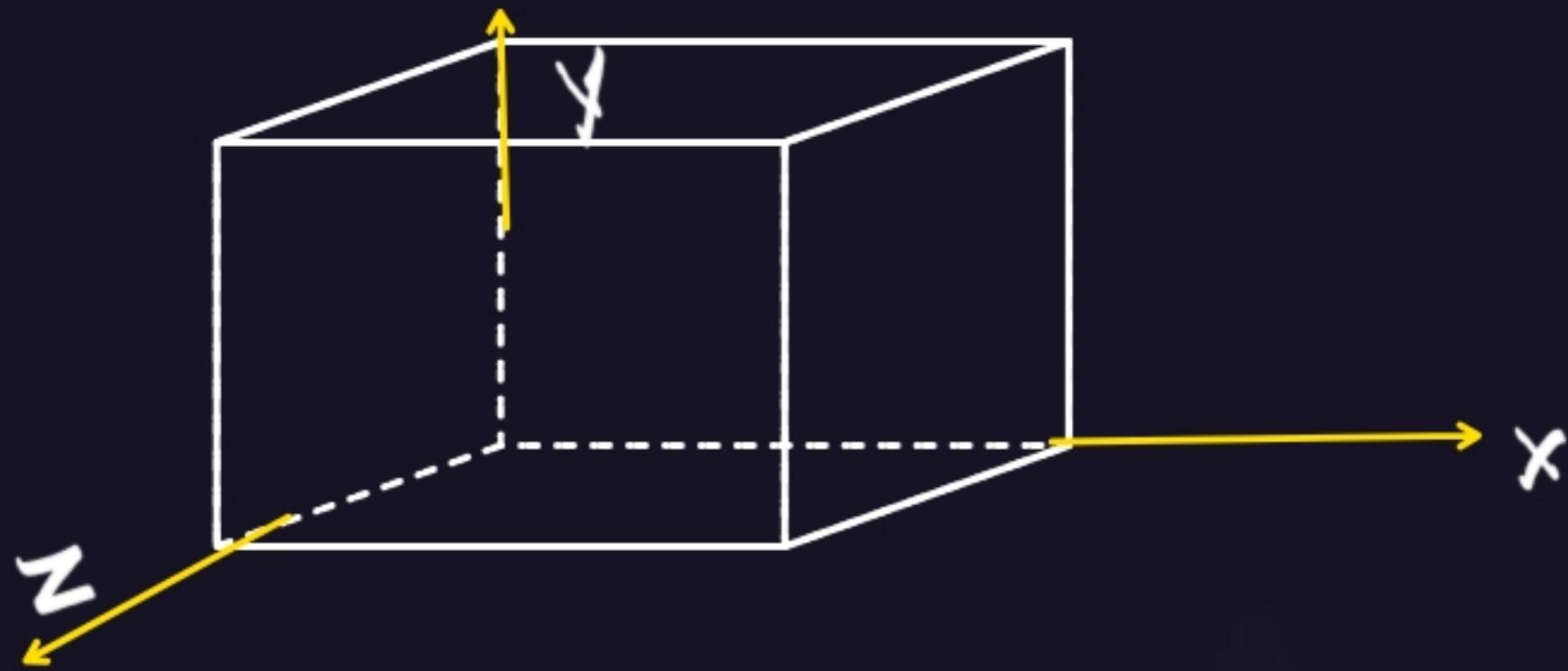


FM By Rk sir | Use code Y201 For Max disc

Adda247

EQUATION OF CONTINUITY



3D
unsteady
compressible

$$\frac{\partial(\rho u)}{\partial x} + \frac{\partial(\rho v)}{\partial y} + \frac{\partial(\rho w)}{\partial z} + \frac{\partial \rho}{\partial t} = 0$$

$$A_1 v_1 = A_2 v_2 \text{ or } Q_1 = Q_2$$

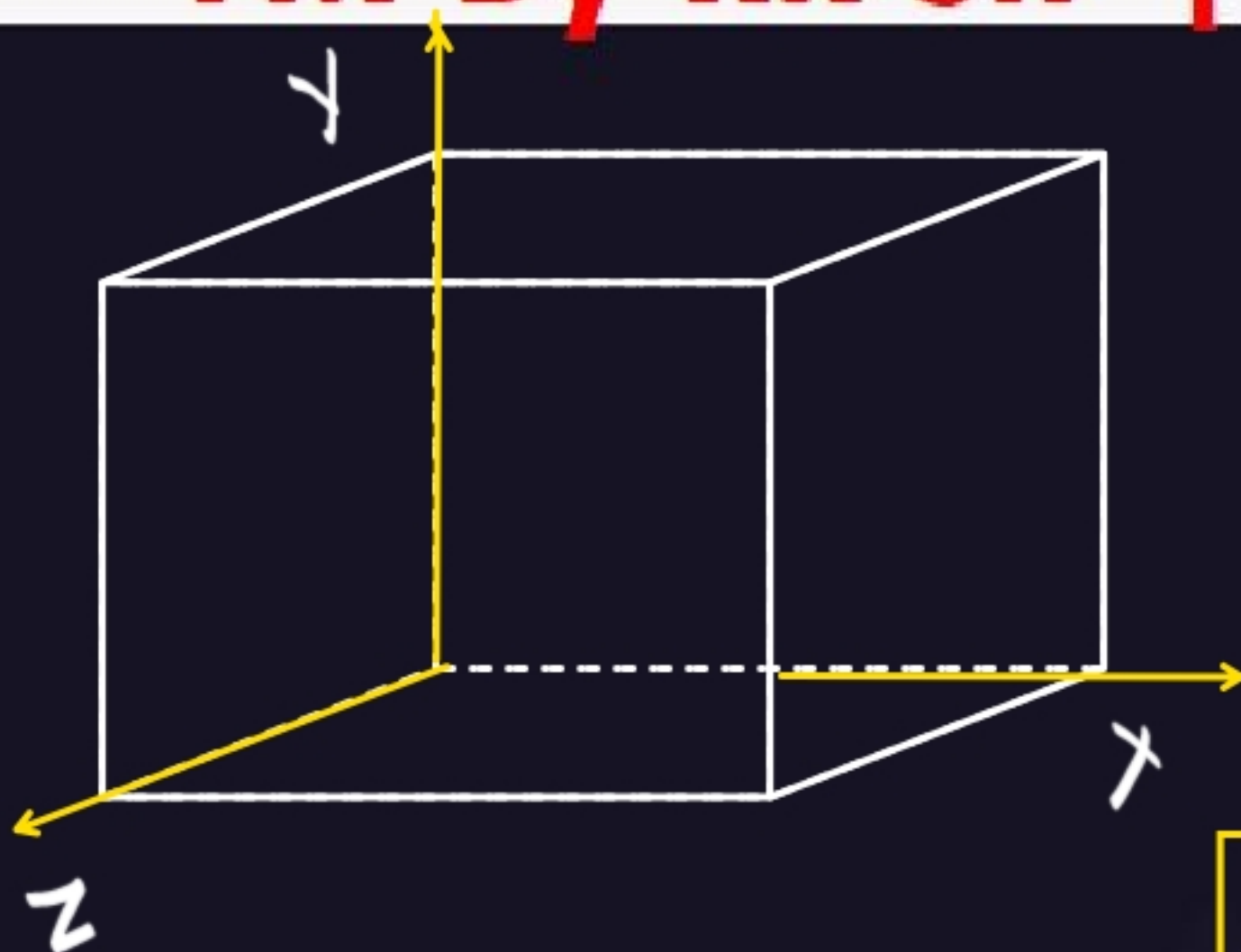
1D
steady
incompressible

1D,
steady
compressible

$$\rho_1 A_1 v_1 = \rho_2 A_2 v_2$$

$$\rho_1 Q_1 = \rho_2 Q_2$$

$$\dot{m} = c$$



3D
unsteady
incompressible ✓

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} + \frac{1}{\rho} \frac{\partial \rho}{\partial t} = 0$$

$$\rho \left[\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} \right] + \frac{\partial \rho}{\partial t} = 0$$

$$\nabla \cdot \vec{v} + \frac{1}{\rho} \frac{\partial \rho}{\partial t} = 0$$

ρ

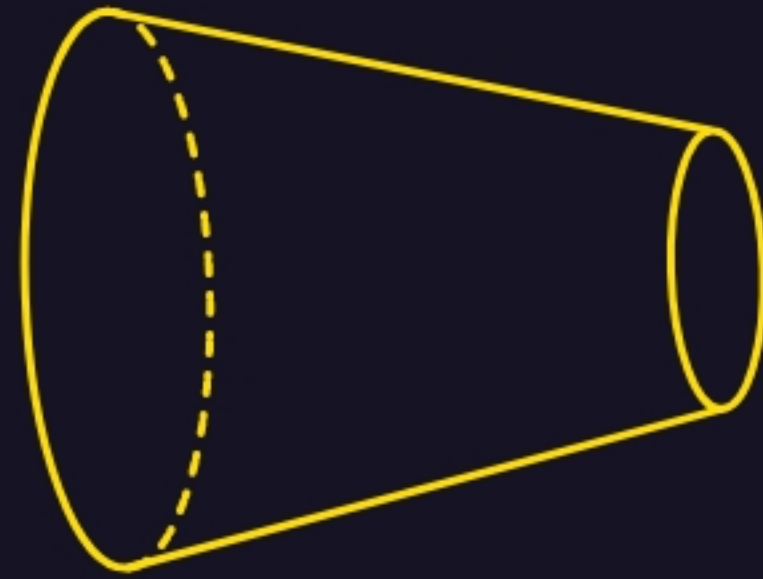
3D
Steady
incompressible

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0$$

$$\nabla \cdot \vec{v} = 0$$

2D, Steady, incompressible

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0$$



1D
Steady
Comp

$$\frac{\partial (\rho u)}{\partial x} + 0 = 0$$

$$\frac{\partial (\rho u A)}{\partial x} = 0 \times A$$

$$\rho A v = C$$

$$\dot{m} = C$$

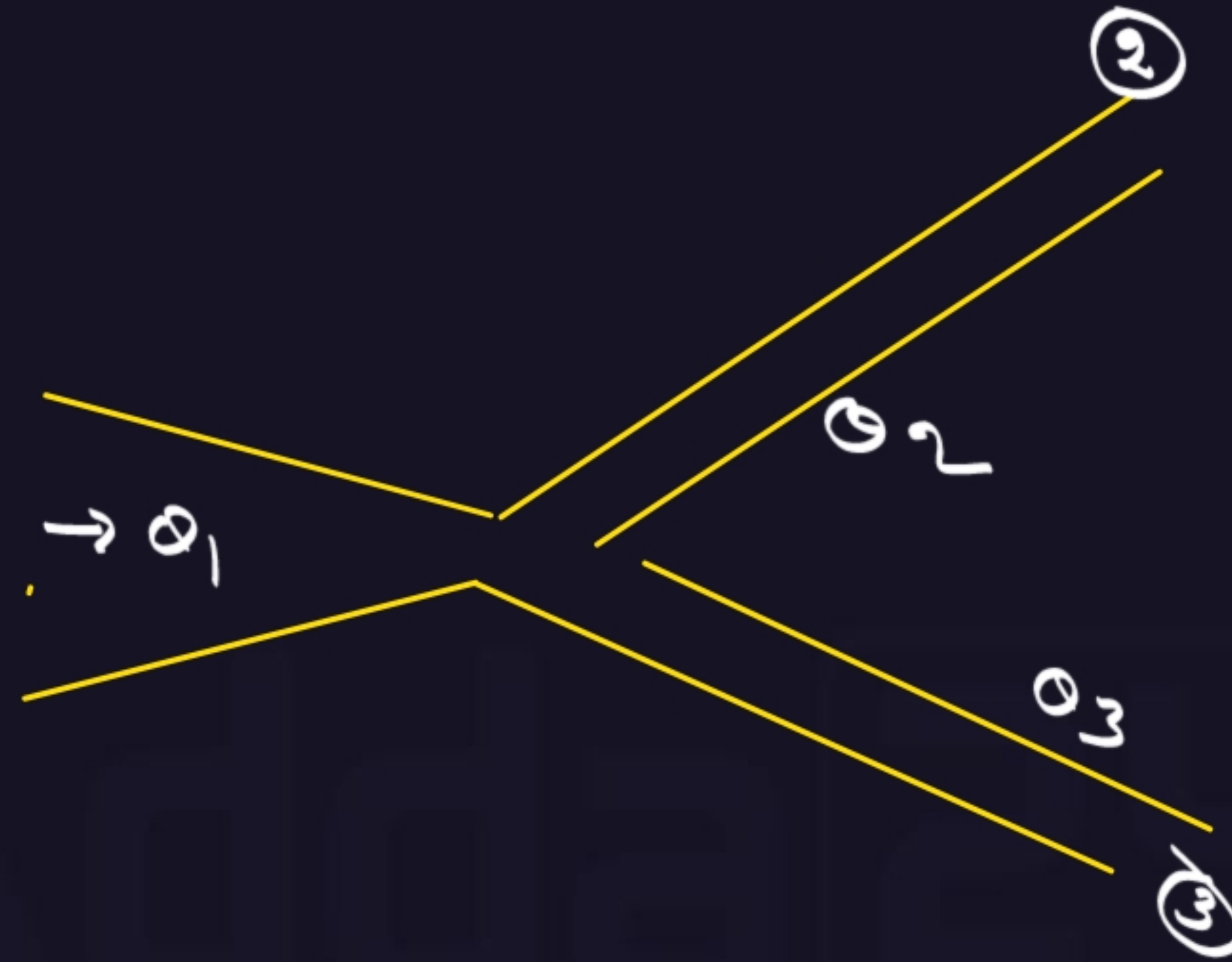
$$\rho_1 A_1 v_1 = \rho_2 A_2 v_2$$

$$\rho_1 \theta_1 = \rho_2 \theta_2$$

1D
Steady
incomp

$$\theta_1 = \theta_2$$

$$\underline{A_1 v_1 = A_2 v_2}$$



$$\theta_1 = \theta_2 + \theta_3$$

$$A_1 v_1 = A_2 v_2 + A_3 v_3$$

$$u = s + 2x$$

$$v = ?$$

$$0 = \frac{2}{e^x} + \frac{2x}{e^x}$$

$$0 = (x+1) \frac{2}{e^x} + (x-2) \frac{2}{e^x}$$

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$$\left(\frac{2}{e^x} + \frac{2x}{e^x} \right) = 0$$



$$A_2 = 0.96 A_1$$

$$\rho_2 = 0.95 \rho_1$$

$$\underline{\rho_1 A_1 v_1 = \rho_2 A_2 v_2}$$