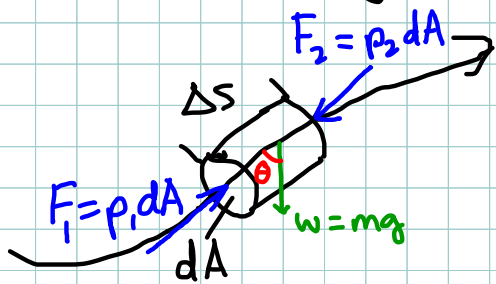


Bernoulli's Equation



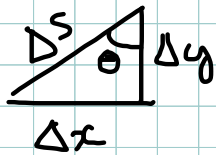
$$\sum F_{\parallel} = ma_{\parallel}$$

$$\sum F_{\parallel} = F_1 - F_2 - mg \cos \theta$$

$$m = \rho dA \Delta s$$

$$\sum F = p_1 dA - p_2 dA - (\rho dA \Delta s) g \cos \theta$$

$$= (p_1 - p_2) dA - \rho dA \Delta s g \frac{\Delta y}{\Delta s}$$



$$\cos \theta = \frac{\Delta x}{\Delta s}$$

$$ma = (\rho dA \Delta s) \frac{\Delta v}{\Delta t} = \rho dA \left(\frac{\Delta s}{\Delta t} \right) \Delta v$$

$$= \rho dA v \Delta v$$

$$\sum F = ma$$

$$(p_1 - p_2) dA - \rho dA g \Delta y = \rho dA v \Delta v$$

$$p_1 - p_2 - \rho g (y_2 - y_1) = \rho \frac{1}{2} \Delta(v^2) = \rho \frac{1}{2} (v_2^2 - v_1^2)$$

$$p_1 + \rho g y_1 + \frac{1}{2} \rho v_1^2 = p_2 + \rho g y_2 + \frac{1}{2} \rho v_2^2$$