

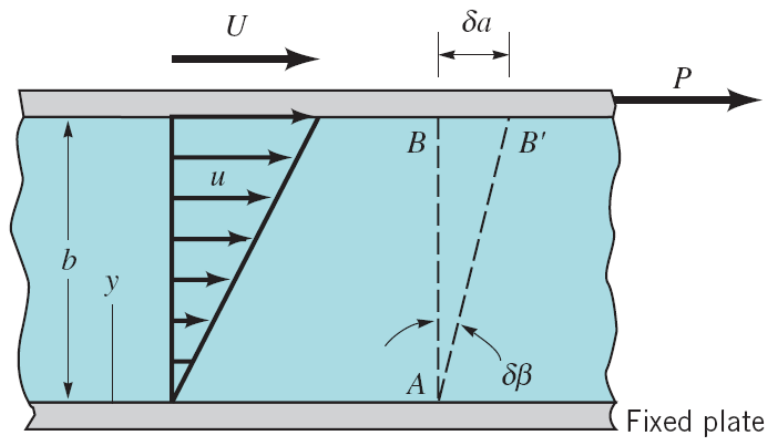
NAME _____

Fluids-ID _____

Quiz 1.

For a parallel plate arrangement shown below, it is found that a shearing stress of 150Pa develops at the upper plate when it is pulled at a velocity of 1 m/s. Find the distance b between two plates. The viscosity of the fluid between plates is $0.3 \text{ N}\cdot\text{s}/\text{m}^2$.

(Hint: $u(y) = \frac{U}{b}y$)



Solution:

$$\tau = \mu \frac{du}{dy}$$

(+5 points)

$$\frac{du}{dy} = \frac{U}{b}$$

(+3 points)

$$\therefore b = \mu \frac{U}{\tau} = 0.3 \text{ N}\cdot\text{s}/\text{m}^2 \frac{1 \text{ m/s}}{150 \text{ N/m}} = 0.002 \text{ m} = 2 \text{ mm}$$

(+2 points)