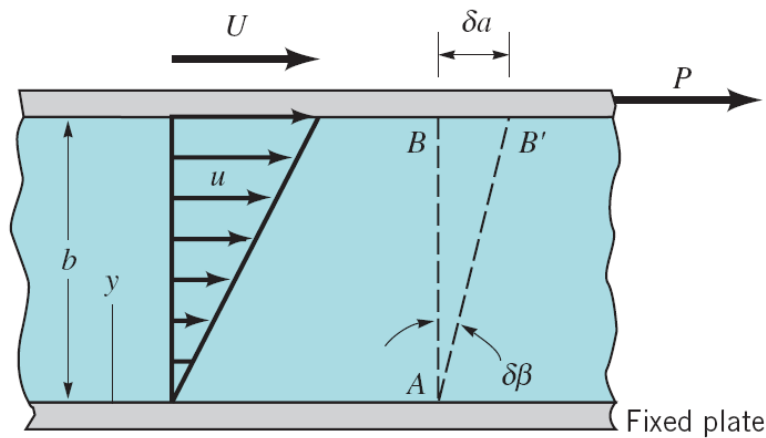NAME

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 $0.3\ N.s/m^2$.

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

Solution:

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

(+5 points)

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

(+3 points)

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

(+2 points)