

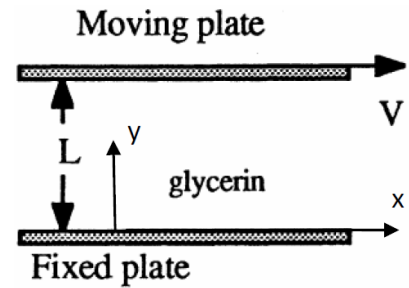
NAME _____

Fluids-ID _____

Quiz 1.

In the figure shown at the right, the fluid is glycerin at 20°C ($\mu = 1.5 \text{ N}\cdot\text{s}/\text{m}^2$) and the width between plates is $L = 6 \text{ mm}$. What shear stress (in Pa) is required to move the upper plate at $V = 5.5 \text{ m/s}$? The fluid velocity profile between the plates is given as

$$u(y) = \frac{V}{L} \cdot y$$



Solution:

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

(+5 points)

$$\frac{du}{dy} = \frac{V}{L}$$

(+3 points)

$$\tau = \mu \frac{V}{L} = \left(1.5 \frac{\text{Ns}}{\text{m}^2}\right) \frac{(5.5 \text{ m/s})}{(0.006 \text{ m})} = 1375 \text{ Pa}$$

(+2 points)