

2.18/25 ~ prob. no/page.

Summary statement

GIVEN: WATER AT 20° C
FLOWS AS SHOWN
WITH

$$V = 10y^{1/6},$$

$$V \hat{=} \text{m/s}, y = \text{DISTANCE}$$

FIND: SHEAR STRESS AT $y = 2\text{mm}$ SOLUTION:

• NEWTON'S LAW OF VISCOSITY

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

• μ FOR WATER = $1 \cdot 10^{-3} \text{ N}\cdot\text{s}/\text{m}^2$ (TABLE B.2, p. 507)

$$\left. \frac{dV}{dy} \right|_{y=2\text{mm}} = \left. \frac{d(10y^{1/6})}{dy} \right|_{y=2\text{mm}}$$

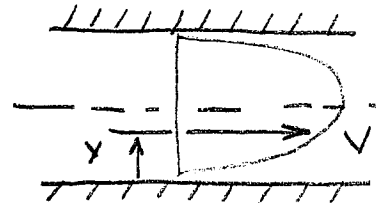
$$\left. = \frac{10}{6} y^{-5/6} \right|_{y=2\text{mm}}$$

$$\left. = \frac{10}{6} \left(2\text{mm} \times \frac{1\text{m}}{1000\text{mm}} \right)^{-5/6} = 296 \frac{\text{m/s}}{\text{m}} \right.$$

For fluid properties, state table and page

$$\tau = 1 \cdot 10^{-3} \frac{\text{N}\cdot\text{s}}{\text{m}^2} \times 296 \frac{1}{\text{s}}$$

$$\tau = 0.296 \frac{\text{N}}{\text{m}^2}$$

box
answerone set
per class(1ST ASSIGNMENT - PUT
YOUR NAME ALSO

Simple sketch

how many pages ~