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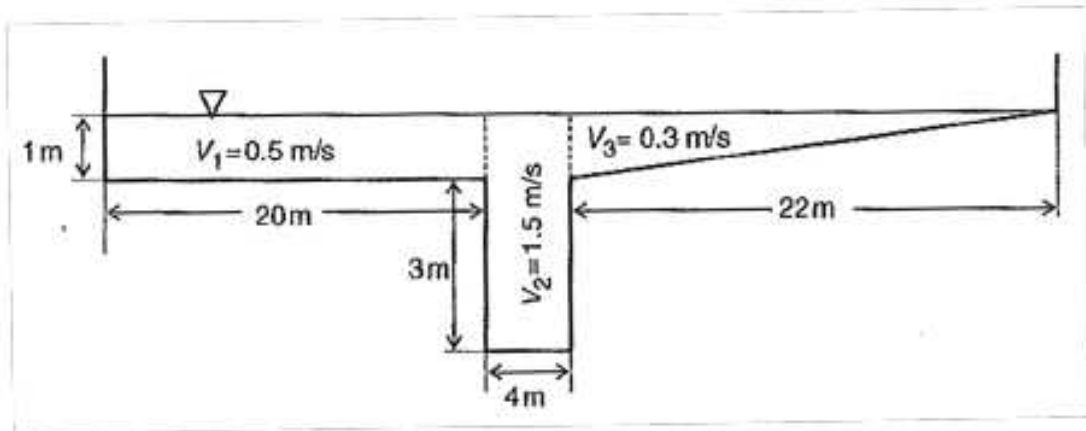
Problem #1

A nearly horizontal channel has a bottom width of 3 ft, and it carries a discharge of 60 cfs at a depth of 4 ft. Determine the magnitude and direction of the hydrostatic pressure force exerted on each of the sidewalls per unit length of the channel if:

- The channel is rectangular with vertical sidewalls
- The channel is trapezoidal with each sidewall sloping outward at a slope 2 horizontal over 1 vertical, that is $m = 2$.

Problem #2

Determine the average cross-sectional velocity V and the discharge Q for the compound channel shown below:

**Problem #3**

Determine the rate of momentum transfer and the rate of kinetic energy transfer for the compound channel shown in Problem #2.

Problem #4

A trapezoidal channel with bottom width $b = 5$ ft and side slopes $m = 2$ (that is 2 horizontal over 1 vertical) carries $Q = 100$ cfs at depth $y = 3.15$ ft. The water temperature is 60 F, and the kinematic viscosity at this temperature is $\nu = 1.217 \cdot 10^{-5}$ ft²/s.

- (a) Determine if the flow is turbulent or laminar.
- (b) Determine if the flow is subcritical or supercritical.



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