

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. A vertical right-angled triangular surface has a vertex in the free surface of a liquid (sp wt γ) as shown in Fig. 1.
 - (1) Find the force on one side of the vertical triangle ABC by integration. (10%)
 - (2) Determine by integration the pressure center below the liquid surface in the triangle area of ABC . (10%)

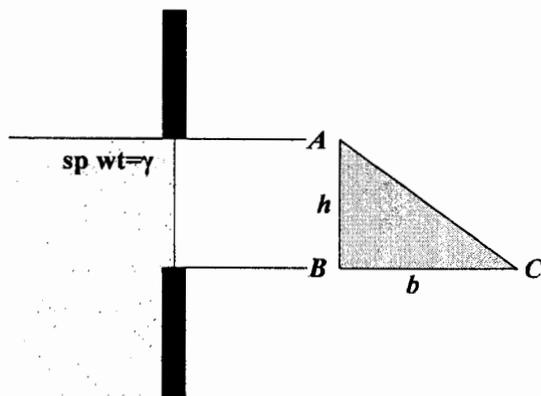


Fig. 1

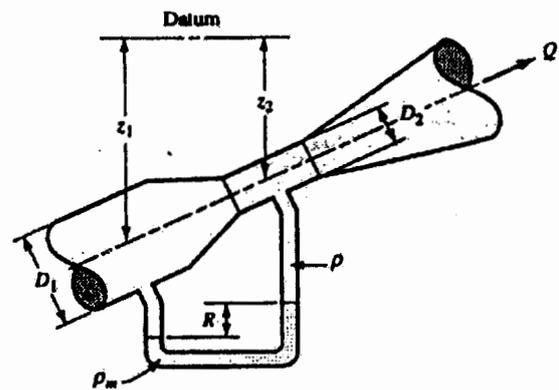


Fig. 2

3. A triangular pipe with a bottom width of a as shown in Fig. 3, please determine the depth y for:
 - (1) a maximum velocity and given n and S . (10%)
 - (2) a maximum discharge and given n and S . (5%)

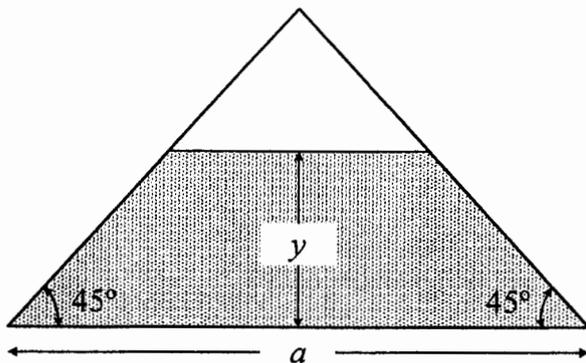


Fig. 3

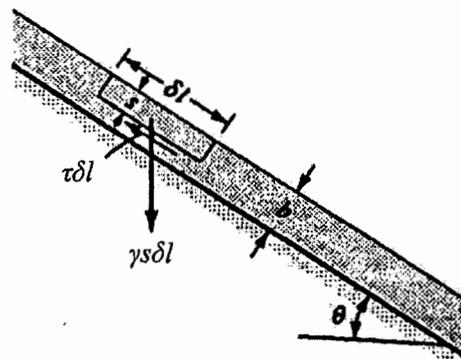


Fig. 4

4. With a free body, as in Fig. 4, for uniform flow of a thin lamina of liquid down an inclined plane.
 - (1) Please derive the velocity distribution and the discharge per unit width. (15%)
 - (2) For a thin film of water flows over a parking lot of bottom slope 0.003, please find the depth if the flow is 0.08 L/s per meter of width and $\nu = 10^{-6} \text{ m}^2/\text{s}$. (10%)
5. Please draw a figure and determine the momentum correction factor for laminar flow in a round tube. (20%)