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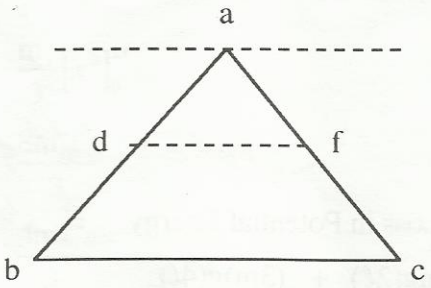
9 (a) A triangular lamina abc is immersed in a vertical position in water with its vertex a at the surface and its base [bc] parallel to the surface.

(i) If |bc| = 10 cm and the height of the triangle is 7.5 cm, find the thrust on abc due to the water.

(ii) If d and f are the midpoints of [ab], [ac] respectively, find the ratio

$$\frac{\text{thrust on adf}}{\text{thrust on dbcf}}$$



T_{abc} = Pressure x Area

$= \rho g\left(\frac{2}{3} \times 0.075\right)\left\{\frac{1}{2}(0.1)(0.075)\right\}$ 5

$= 0.1875g$ or 1.8375

T_{adf} = Pressure x Area

$= \rho g\left(\frac{2}{3} \times \frac{0.075}{2}\right)\left\{\frac{1}{2}(0.05)\left(\frac{0.075}{2}\right)\right\}$

$= 0.0234375g$ or 0.2296875 5

$\Rightarrow \quad T_{dbcf} = 0.1640625g$ or 1.6078125 5

$\Rightarrow \quad \frac{T_{adf}}{T_{dbcf}} = \frac{0.2296875}{1.6078125}$ or $\frac{1}{7}$ or 1.43 5

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