

1. Make a comparison between the energy equation and Bernoulli equation. (15%)
2. The U-tube of Fig. 2 contains mercury and rotates about the off-center axis a-a. At rest, the depth of mercury in each leg is 150 mm as illustrated. Determine the angular velocity for which the difference in heights between the two legs is 75 mm. (15%)
3. A constant-thickness film of viscous liquid flows in laminar motion down a plate inclined at angle θ , as in Fig. 3. The velocity profile is

$$u = Cy(2h-y) \quad v = w = 0$$

Find the constant C in terms of specific weight, and viscosity and the angle θ , and the volume flux Q per unit width in terms of these parameters. (20%)

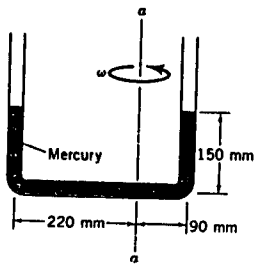


Fig. 2

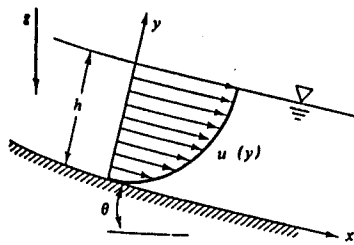


Fig. 3