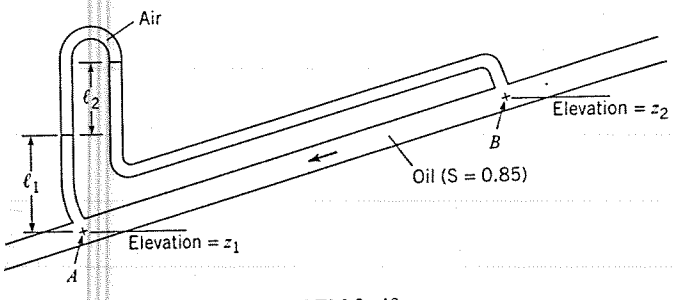

PROBLEM 3.49

3.49 Determine (*a*) the difference in pressure and (*b*) the difference in piezometric head between points *A* and *B*. The elevations z_A and z_B are 10 m and 11 m, respectively, $\ell_1 = 1$ m, and the manometer deflection ℓ_2 is 50 cm.

$$p_A - .85 \times 9810 \times 1 + .85 \times 9810 \times .5 = p_B$$ neglect Δp_{air}

$$p_A - p_B = 4.169\ \Delta p_a$$

$p + \gamma z$ = piezometric pressure

$$\frac{p}{\gamma} + z = h = \text{piezometric head}$$

$$\left(\frac{p_A}{\gamma} + z_A\right) - \left(\frac{p_B}{\gamma} + z_B\right) = \Delta h$$

$$\left(\frac{p_A - p_B}{\gamma}\right) + \left(z_A - z_B\right) = \Delta h$$

$$\frac{4169}{.85 \times 9810} - 1 = \Delta h = -.5\ m$$