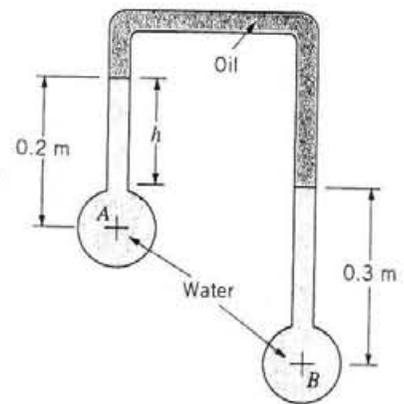


2.40

2.40 The inverted U-tube manometer of Fig. P2.40 contains oil ($SG = 0.9$) and water as shown. The pressure differential between pipes A and B, $p_A - p_B$, is -5 kPa. Determine the differential reading, h .



■ FIGURE P2.40

$$p_A - \gamma_{H_2O} (0.2 \text{ m}) + \gamma_{oil} (h) + \gamma_{H_2O} (0.3 \text{ m}) = p_B$$

Thus,

$$h = \frac{(p_B - p_A) + \gamma_{H_2O} (0.2 \text{ m}) - \gamma_{H_2O} (0.3 \text{ m})}{\gamma_{oil}}$$

$$= \frac{5 \times 10^3 \frac{\text{N}}{\text{m}^2} - (9.80 \times 10^3 \frac{\text{N}}{\text{m}^3})(0.1 \text{ m})}{8.95 \times 10^3 \frac{\text{N}}{\text{m}^3}} = \underline{\underline{0.449 \text{ m}}}$$