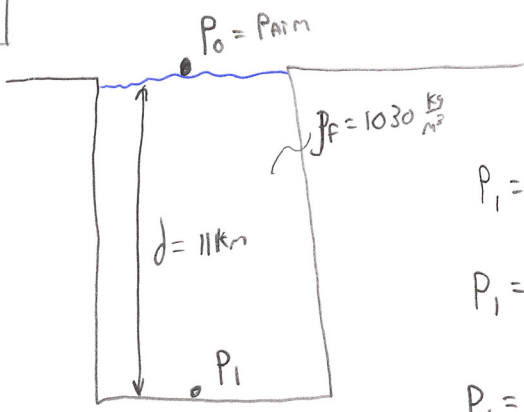


P 13.8

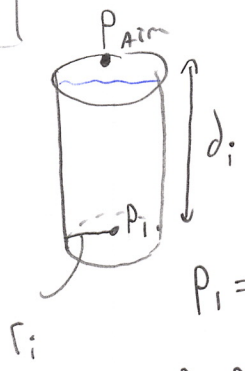


$$P_1 = P_0 + \rho_F g d$$

$$P_1 = 101325 \text{ Pa} + (1030 \frac{\text{kg}}{\text{m}^3})(9.81 \frac{\text{m}}{\text{s}^2})(11000 \text{ m})$$

$$P_1 = 111248625 \text{ Pa} \times \frac{1 \text{ ATM}}{101325 \text{ Pa}} = 1098 \text{ ATM}$$

P 13.12



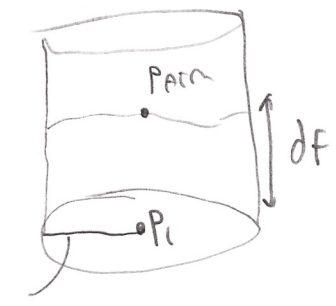
$$V = \pi r_i^2 d_i$$

$$P_1 = P_{atm} + \rho_F g d_i$$

$$P_1 - P_{atm} = \rho_F g d_i$$

$$P_{gauge} = \rho_F g d_i$$

$$P_{gauge} = 0.40 \text{ ATM}$$



$$V = \pi r_F^2 d_F$$

$$r_F = 2r_i$$

$$w/ V = \text{const}$$

$$r^2 \propto \frac{1}{d}$$

$$\text{IF } r \rightarrow 2r$$

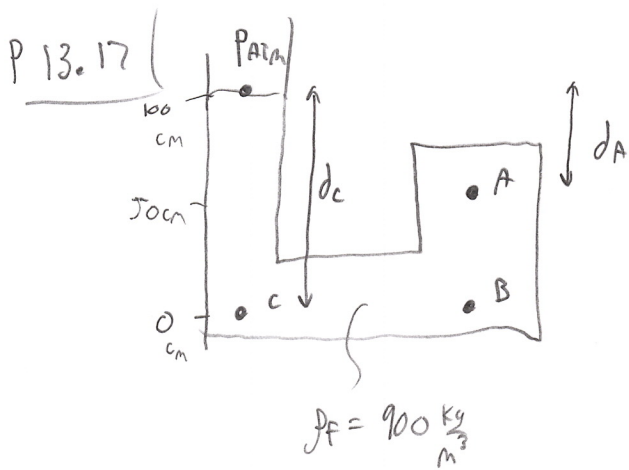
$$\text{THEN } d \rightarrow \frac{1}{4} d$$

$$\text{SINCE } P_{gauge} \propto d$$

$$P_{gauge} \rightarrow \frac{1}{4} P_{gauge}$$

$$P_{gauge_F} = \frac{1}{4} (0.40) \text{ ATM}$$

$$P_{gauge_F} = 0.10 \text{ ATM}$$



a) $P_A = P_{\text{atm}} + \rho_F g d_A$

$$P_A = 101325 + 900(9.8)(0.50)$$

$$P_A = 105735 \text{ Pa}$$

b) $P_B - P_A = (P_{\text{atm}} + \rho_F g d_B) - (P_{\text{atm}} + \rho_F g d_A)$

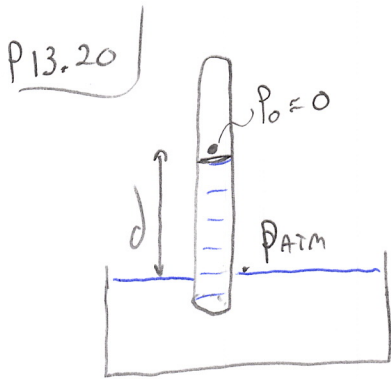
$$\Delta P_{BA} = \rho_F g d_B - \rho_F g d_A$$

$$\Delta P_{BA} = \rho_F g (d_B - d_A)$$

$$\Delta P_{BA} = 900(9.8)(1 - 0.5)$$

$$\Delta P_{BA} = 4410 \text{ Pa}$$

$$= \Delta P_{CA}$$



$$P_{\text{atm}} = P_0 + \rho_F g d$$

$$\frac{P_{\text{atm}} - P_0}{\rho_F g} = d$$

$$d = \frac{101325 - 0}{(1000)(9.8)} \approx 10.3 \text{ m}$$