The gage pressure of the air in the tank shown in the Figure is measured to be 80 kPa. Determine the differential height h of the mercury column ($\rho_W = 1000$ kg/m^3).

$$p_{Air} = p_{atm} + \rho_O g \times 0.75 + \rho_M g \times h_M - \rho_W g \times 0.3$$
$$= p_{atm} + \rho_W g \left(\frac{\rho_O}{\rho_W} \times 0.75 + \frac{\rho_M}{\rho_W} \times h_M - \frac{\rho_W}{\rho_W} \times 0.3 \right)$$
$$= p_{atm} + \rho_W g (SG_O \times 0.75 + SG_M \times h_M - 0.3)$$

$$p_{Air,gage} = p_{Air} - p_{atm} = \rho_W g (SG_O \times 0.75 + SG_M \times h_M - 0.3)$$

$$h_M = \frac{\frac{p_{Air,gage}}{\rho_W g} - SG_O \times 0.75 + h_M}{SG_M} = \frac{\frac{80{,}000}{1{,}000 \times 9.81} - 0.72 \times 0.75 + 0.3}{13.6} = 0.582 \text{ m}$$