

Hidráulica I – 2024/2025
1º MAP – 14/03/2025

Problema 1

a) $p_B^{rel} = p_B^{abs} - p_{atm}$ 1,0 val

$$= 220 \times 10^3 - 101,2 \times 10^3 = 118,8 \times 10^3 \text{ Pa}$$

$$= 118,8 \text{ kPa} \quad \text{0,5 val}$$

b) $\gamma_{merc} = d \times \gamma_{\text{água}} =$ 1,0 val

$$= 13,6 \times 9800 = 133,3 \times 10^3 \text{ Pa} = 133,3 \text{ kPa} \quad \text{0,5 val}$$

c) $p_2 = p_B$ 0,5 val

$$\frac{p_2}{\gamma_{merc}} + z_2 = \frac{p_1}{\gamma_{merc}} + z_1 \rightarrow p_1 = p_2 + \gamma_{merc} \times (z_2 - z_1) \quad \text{1,0 val}$$

$$p_2 = 1,188 \times 10^5 + 13,6 \times 9800 \times 0,5 = 185,4 \times 10^3 \text{ Pa}$$

$$\frac{p_A}{\gamma_{\text{água}}} + z_A = \frac{p_1}{\gamma_{\text{água}}} + z_1 \rightarrow p_A = p_1 + \gamma_{\text{água}} \times (z_1 - z_A) \quad \text{1,0 val}$$

$$p_A = 1,854 \times 10^5 - 9800 \times 0,4 = 181,5 \times 10^3 \text{ Pa}$$

$$p_A^{mca} = \frac{p_A^{Pa}}{\gamma_{\text{água}}} = \frac{181,5 \times 10^3}{9800} = 18,52 \text{ mca} \quad \text{0,5 val}$$