

$$\textcircled{1} \begin{cases} m = 12 \text{ kg} \rightarrow P_1 = 118 \text{ N} \\ L_1 = 70 \text{ cm} = 0.7 \text{ m} \end{cases}$$

$$\textcircled{2} \begin{cases} m = 15 \text{ kg} \rightarrow P_2 = 147 \text{ N} \\ L_2 = 85 \text{ cm} = 0.85 \text{ m} \end{cases}$$

$$F = K(L - L_0)$$

$$118 = K(0.7 - L_0)$$

$$147 = K(0.85 - L_0)$$

$$K = \frac{118}{0.7 - L_0}$$

$$K = \frac{147}{0.85 - L_0}$$

$$\boxed{K = K}$$

$$\frac{118}{0.7 - L_0} = \frac{147}{0.85 - L_0} \Rightarrow 118(0.85 - L_0) = 147(0.7 - L_0)$$

$$100.3 - 118L_0 = 102.9 - 147L_0$$

$$147L_0 - 118L_0 = 102.9 - 100.3 \Rightarrow 29L_0 = 2.6$$

$$L_0 = \frac{2.6}{29} = 0.09 \text{ cm}$$

$$K = \frac{118}{0.7 - 0.09} = 193.4 \text{ N/m}$$

$$\rightarrow \text{is } 8 \text{ kg? } m_3 = 8 \text{ kg} \rightarrow P_3 = \underline{\underline{78.5 \text{ N}}}$$

$$F = K(L - L_0)$$

$$78.5 = 193.4(L - 0.09) \rightarrow L - 0.09 = \frac{78.5}{193.4} = 0.40$$

$$L = 0.4 + 0.09 = \underline{\underline{0.49 \text{ m}}}$$

$$3) v = 130 \text{ km/h} = 36'1 \text{ m/s}$$



$$A) s = \cancel{v_0} + v \cdot t = 36'1 \cdot 0'4 = \underline{14'5 \text{ m}}$$

$$B) \begin{cases} v_0 = 36'1 \\ v_f = 0 \\ a = 3'7 \text{ m/s}^2 \\ s_0 = 14'5 \text{ m} \end{cases}$$

$$v_f = v_0 - at$$

$$0 = 36'1 - 3'7 \cdot t$$

$$3'7 \cdot t = 36'1 \rightarrow t = \frac{36'1}{3'7}$$

$$t = 9'7 \text{ s}$$

$$s = s_0 + v_0 \cdot t - \frac{1}{2} a t^2 = 14'5 + 36'1 \cdot 9'7 - \frac{1}{2} 3'7 \cdot 9'7^2$$

$$s = 190'6 \text{ m}$$

$$4) S_T = 270 \text{ km} = 270000 \text{ m}$$

$$v_A = 140 \text{ km/h} = 39 \text{ m/s}$$

$$v_B = 180 \text{ km/h} = 50 \text{ m/s}$$

$$s_A = v_A \cdot t = 39 \cdot t$$

$$s_B = v_B \cdot t = 50 \cdot t$$

$$S_T = s_A + s_B \quad 270000 = 39 \cdot t + 50 \cdot t = 89 \cdot t$$

$$t = \frac{270000}{89} = 3033'7 \text{ s}$$

$$s_A = 39 \cdot 3033'7 = 118315 \text{ m}$$

$$s_B = 50 \cdot 3033'7 = \underline{\underline{151685 \text{ m}}}$$

$$5) P = 26000 \text{ mm Hg} - \frac{101325 \text{ Pa}}{760 \text{ mm Hg}} = \underline{\underline{3466382 \text{ Pa}}}$$

$$P_{\text{sub}} = P_{\text{at}} + d \cdot g \cdot h$$

$$3466382 = 101325 + 1024 \cdot 9.81 \cdot h$$

$$h = \frac{3466382 - 101325}{1024 \cdot 9.81} = \underline{\underline{335 \text{ m}}}$$

$$6) V_{\text{TOTAL}} = M r^2 \cdot L = M \cdot 0.05^2 \cdot 0.5 = 0.004 \text{ m}^3$$

$$V_{\text{PLASTICO}} = M r^2 \cdot L = M \cdot 0.04^2 \cdot 0.5 = 0.0025 \text{ m}^3$$

$$V_{\text{Alum}} = V_T - V_{\text{PLAS}} = 0.004 - 0.0025 = 0.0015 \text{ m}^3$$

$$P_{\text{cilindro}} = P_{\text{plast}} + P_{\text{AL}} = m_P \cdot g + m_{\text{AL}} \cdot g =$$

$$= V_P \cdot d_P \cdot g + V_{\text{AL}} \cdot d_{\text{AL}} \cdot g = 0.0025 \cdot 350 \cdot 9.81 + 0.0015 \cdot 2700 \cdot 9.81$$

$$P_{\text{cilindro}} = 48.3 \text{ N}$$

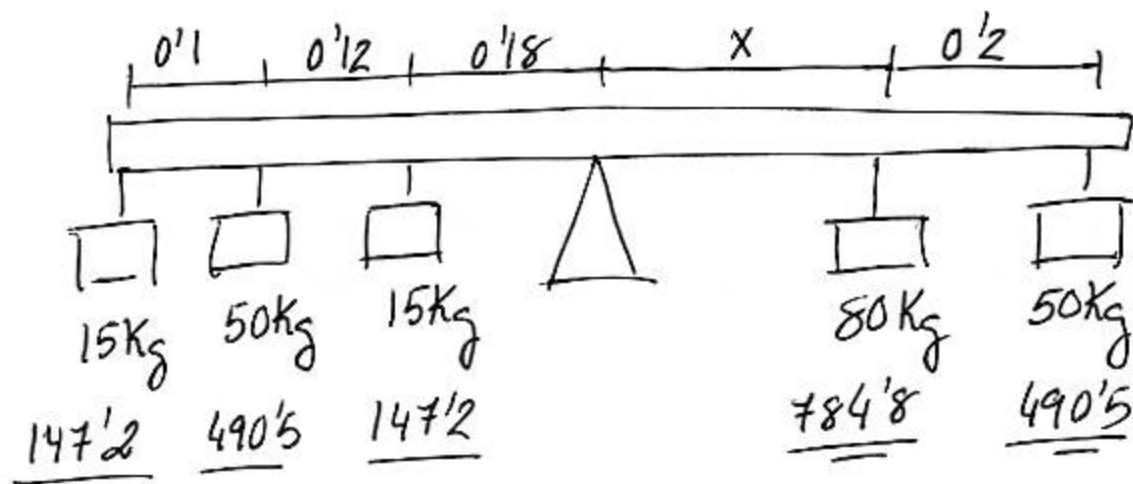
$$E_{\text{Hg}} = V_{\text{sumerg}} \cdot d_{\text{H}_2\text{O}} \cdot g = 0.004 \cdot 1040 \cdot 9.81 =$$

$$= 40.8 \text{ N}$$

$$\boxed{E < P}$$

$$P_{\text{ap}} = P - E = 48.3 - 40.8 = \underline{\underline{7.5 \text{ N}}}$$

(7)



$$147'2 \cdot (0'1 + 0'12 + 0'18) + 490'5 (0'12 + 0'18) + 147'2 \cdot 0'18 =$$

$$= 784'8 \cdot x + 490'5 (x + 0'2)$$

$$147'2 \cdot 0'4 + 147'15 + 26'5 = 784'8 \cdot x + 490'5x + 98'1$$

$$58'9 + 147'15 + 26'5 - 98'1 = 784'8x + 490'5x$$

$$134'45 = 1275'3x$$

$$x = \frac{134'45}{1275'3} = \underline{\underline{0'10}}$$