

(5)

(16) $P = \frac{F}{A}$ $F = mg$ $P = \frac{mg}{A} \Rightarrow \frac{PA}{g} = m = ?$

$$(20 \text{ bar}) \left(\frac{10^5 \text{ N}}{1 \text{ bar}} \right) \pi \left(\frac{0.3 \text{ cm}}{2} \right)^2 \frac{1}{9.8 \frac{\text{m}}{\text{s}^2}} = \underline{1.4 \times 10^4 \text{ kg}}$$

(17) $PV = nRT$ $\left. \begin{array}{l} n = \text{const} \\ T = \text{const} \end{array} \right\} \Rightarrow PV = \text{const}$

$$P_1 V_1 = P_2 V_2$$

$$V_2 = \frac{P_1}{P_2} V_1 = \frac{(10 \text{ bar})}{(1 \text{ bar})} (2.0 \text{ m}^3)$$

$$= \underline{20 \text{ m}^3}$$

(18) $\bar{X} = \frac{\sum m_i x_i}{\sum m_i}$ $\bar{Y} = \frac{\sum m_i y_i}{\sum m_i}$

$$\sum m_i = 4 \text{ kg} + 2 \text{ kg} + 2 \text{ kg} + 4 \text{ kg} = 12 \text{ kg}$$

$$\bar{X} = \frac{(4 \text{ kg})(0) + (2 \text{ kg})(1 \text{ m}) + (2 \text{ kg})(3 \text{ m}) + (4 \text{ kg})(-2 \text{ m})}{12 \text{ kg}}$$

$$\bar{X} = \underline{0}$$

$$\bar{Y} = \frac{(4 \text{ kg})(2 \text{ m}) + (2 \text{ kg})(2 \text{ m}) + (2 \text{ kg})(0) + (4 \text{ kg})(-2 \text{ m})}{12 \text{ kg}}$$

$$\bar{Y} = \frac{4}{12} \text{ m} = \underline{\underline{\frac{1}{3} \text{ m}}}$$