Reading 1/21

① (a) 1 mol N_2 has 6.02×10^{23} molecules
just like 1 mol Ar ⇒ **False**

(b) $1\,\text{mol}\ N_2 \left(\frac{28.0\ \text{g}}{1\,\text{mol}\ N_2}\right) = 28.0\ \text{g}$ vs.
$1\,\text{mol}\ Ar \left(\frac{40.0\ \text{g}}{1\,\text{mol}\ Ar}\right) = 40.0\ \text{g}$ ⇒ **False**

(c) $\frac{28.0\ \text{g}}{1\,\text{mol}\ N_2}$ vs. $\frac{40.0\ \text{g}}{1\,\text{mol}\ Ar}$ ⇒ **False**

② (a) Imagine you have a square of side length L and area $A = L^2$. If the sides change by dL then $dA = 2L\,dL$ (by differentiation/chain rule)

divide by $A = L^2$: $\frac{dA}{A} = \frac{2L}{L^2}dL = \frac{2dL}{L} = 2\alpha\,dT$ **$\eta = 2\alpha$**

α_{Cu} from google search

(b) $\frac{\Delta A}{A} = \eta\,\Delta T = 2\left(1.7 \times 10^{-5}/^\circ\text{C}\right)(100^\circ\text{C}) = 3.4 \times 10^{-3}$

$A_f = A_i(1.0034) = (5.000\ \text{cm}^2)(1.0034) =$ **$5.017\ \text{cm}^2$**