

(example)

$$V = 60 \text{ m}^3$$

$$X_0 = 700 \text{ ppm}$$

$$X = 500 \text{ ppm}$$

$$t = 3 \text{ hrs}$$

$$X_a = 300 \text{ ppm (outside)}$$

$$Q_a = \frac{60 \times (700 - 500)}{3 \times \left(\frac{700 + 500}{2} - 300 \right)} = 13.3 \text{ m}^3/\text{hr}$$

$$Q_a = \frac{V(X_0 - X)}{t \left(\frac{X_0 + X}{2} - X_a \right)}$$

$$\therefore V(X_0 - X) = Q_a \cdot t \cdot \left(\frac{X_0 + X}{2} - X_a \right)$$

$$\text{Production of CO}_2 = V(X_0 - X) = Q_a \cdot t \cdot \left(\frac{X_0 + X}{2} - X_a \right)$$

↖ mean content

$t = 0 \sim t$ Production of CO₂ in the Room = CO₂ gone out

$$t = 0 \rightarrow X = X_0 \text{ ppm}$$

Q_a: Air Leakage (m³/hr)

Room Volume = V m³

