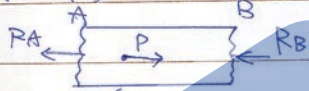


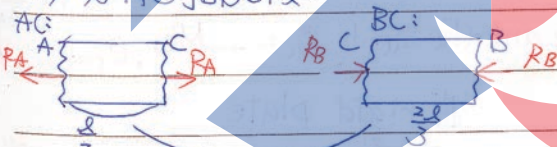
(b) 找變形關係式



$$\Rightarrow \delta = \frac{Fl}{EA} \Rightarrow F, A \text{ 為常數才可用}$$

$\Rightarrow$ 要求 δ_{AB} 分 2 段來做

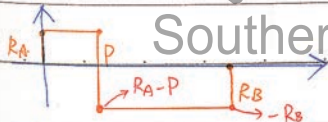
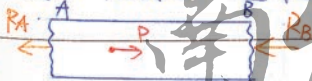
$\Rightarrow$ 分 AC 和 BC 段



$$\text{整段 } \delta_{AB} = \delta_{AC} - \delta_{BC} = 0$$

因為 AB 長度被固定(不變)

求 2 段受力 $\rightarrow$ 畫軸力圖



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$\because \delta_{AB} = 0$
 $\Rightarrow \delta_{AC} = \delta_{BC}$
 AC 之伸長量 = BC 之縮短量

如此, AB 之總長度才能維持不變

(c) 解聯立

$$\begin{cases} R_A + R_B - P = 0 & \text{--- ①} \end{cases}$$

$$\begin{cases} \delta_{AC} = \delta_{BC} & \text{--- ②} \end{cases}$$

$$\frac{R_A \frac{2}{3}l}{EA} = \frac{R_B \frac{2}{3}l}{EA}$$

$$R_A = 2R_B \quad \text{--- ③}$$

$$R_A = \frac{2P}{3}$$

$$R_B = \frac{P}{3}$$

$$(d) \quad \sigma_{AC} = \frac{R_A}{A} = \frac{2P}{3A}$$

$$\sigma_{BC} = \frac{R_B}{A} = \frac{P}{3A}$$

若 P 持續增加, AC 段先損壞

(e) C 點變形 (位移) 量

$$\delta_C = \delta_{AC} = \delta_{BC}$$

$$= \frac{\frac{2P}{3} \cdot \frac{2}{3}l}{EA} = \frac{\frac{P}{3} \cdot \frac{2}{3}l}{EA} = \frac{2Pl}{9EA}$$

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