

p128, ex 4-2, 4-3

由圖可知, 此圖分三段分析

⇒ 先求出  $R_D$  再分段

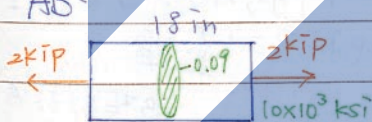
由整體:  $\sum F_x = 0, R_D = 1.5 \text{ kip} (\leftarrow)$

由三段之自由體圖:

$$\because \begin{cases} \sigma = \frac{F}{A} \\ \delta = \frac{F\ell}{EA} \end{cases} \begin{matrix} \text{只能用} F \\ A \text{ 為常數} \end{matrix}$$

⇒ 本題分三段 → 使用  $F, A$  為常數

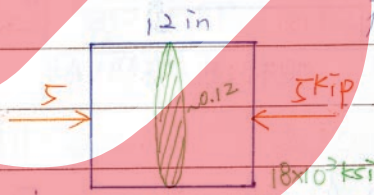
AB:



$$\sigma_{AB} = \frac{F_{AB}}{A_{AB}} = \frac{2000 \text{ lb}}{0.09 \text{ in}^2} = 22200 \text{ psi}$$

$$\delta_{AB} = \frac{F_{AB} \cdot \ell_{AB}}{E_{AB} \cdot A_{AB}} = \frac{18}{10 \times 10^6} \cdot 22200 = 0.04 \text{ in (+)}$$

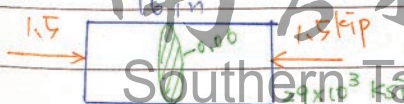
BC:



$$\sigma_{BC} = \frac{F_{BC}}{A_{BC}} = \frac{5000 \text{ lb}}{0.12 \text{ in}^2} = 41700 \text{ psi}$$

$$\delta_{BC} = \frac{12}{18 \times 10^6} \times 41700 = 0.028 \text{ in (-)}$$

CD:



$$\sigma_{CD} = \frac{1500}{0.06} = 25000 \text{ psi}$$

$$\delta_{CD} = \frac{16}{29 \times 10^6} \times 25000 = 0.0138 \text{ in (-)}$$

⇒ 用車由力圖來找每一段車由力

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