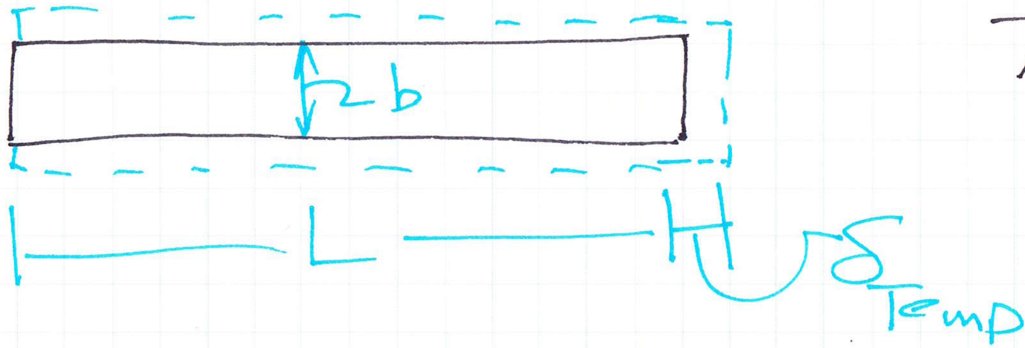
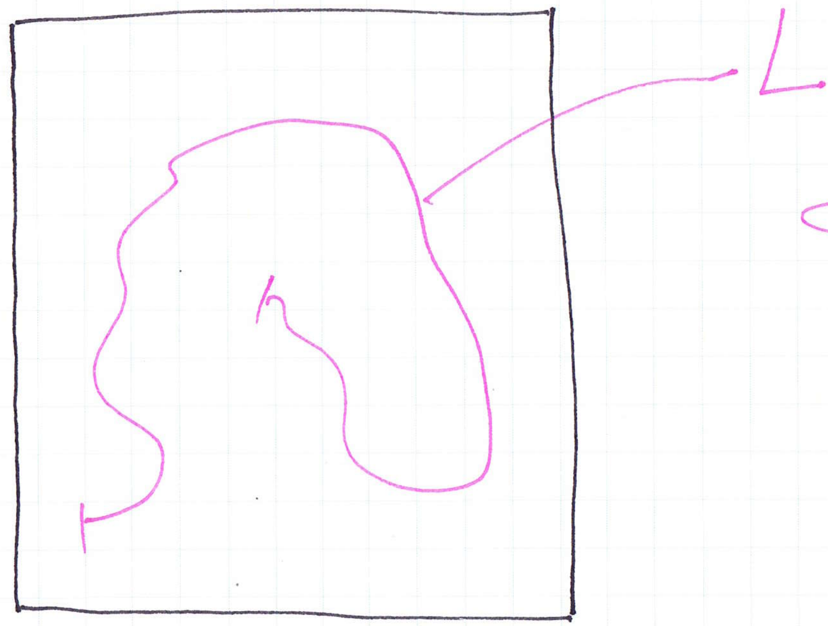


Temperature Increase

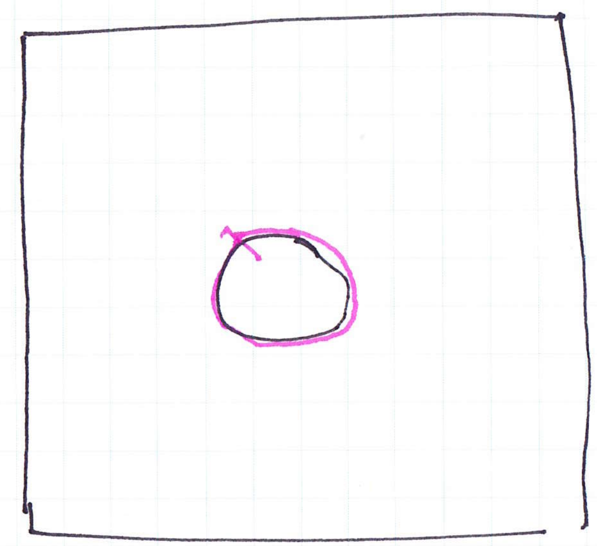
$$\delta_{Temp} = \alpha \, \Delta T \, L$$

- L — length
- ΔT — Temp Change
- α — Thermal Coeff. of Expansion: in/in/°F, /°F, /°C

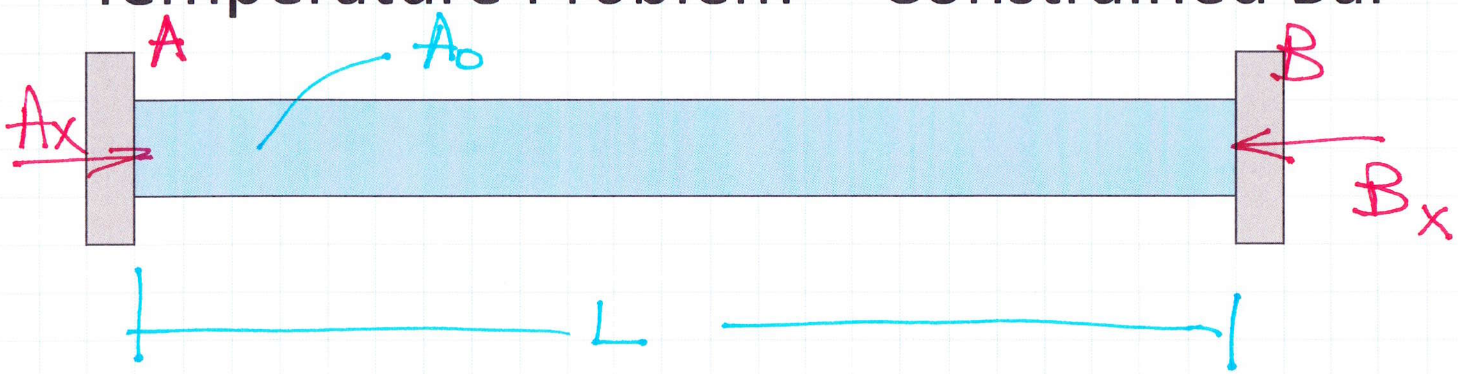
$9/5 \qquad \frac{5}{9}$



$$\delta_{Temp} = \alpha \Delta T L$$



Temperature Problem -- Constrained Bar



$E \quad \alpha$

Temperature Increase

ΔT

Compression

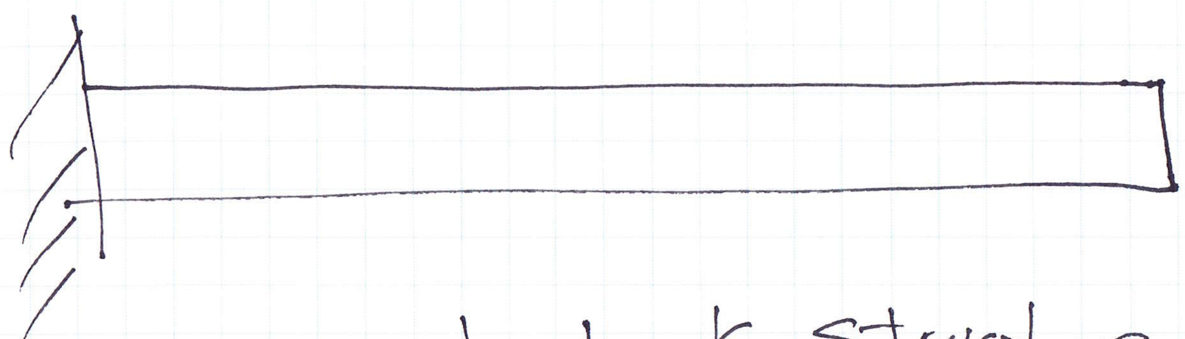
Super Position

$\xrightarrow{+} \sum F_x = 0$

$A_x - B_x = 0$

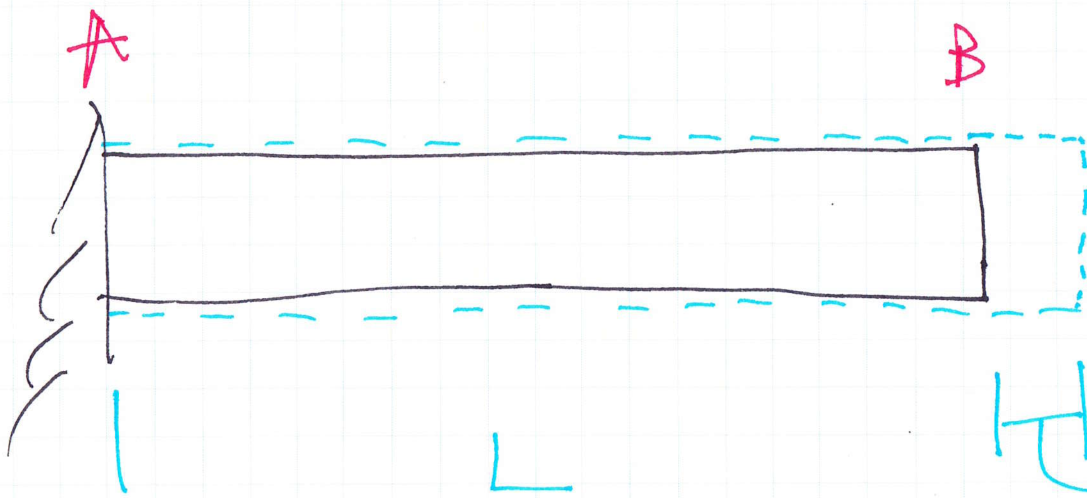
$A_x = B_x$

B_x – is redundant



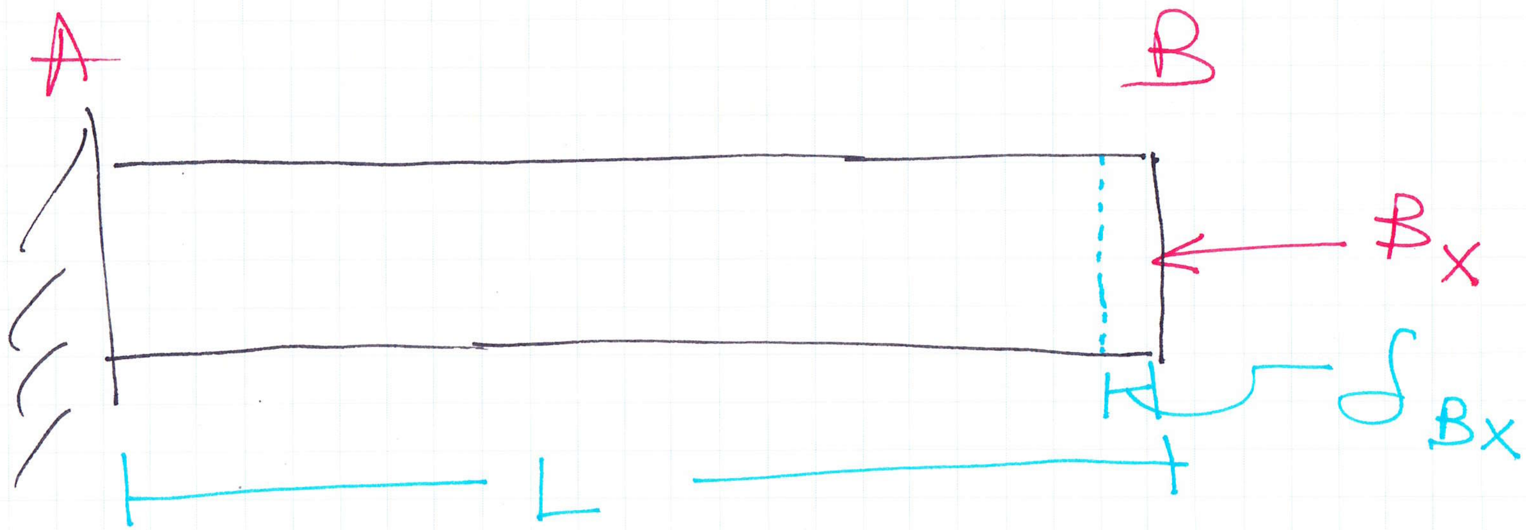
Cut-back structure

Cut Back Structure With ΔT



$\delta_T = \alpha \Delta T L$

Cut-Back Structure with Redundant



$$\delta_{Bx} = \frac{-B_x L}{A_o E}$$

$$\delta_{AB} = 0$$

$$\delta_{temp} + \delta_{Bx} = 0$$

$$\alpha \Delta T L + \frac{-B_x L}{A_o E} = 0$$

$$\frac{B_x}{A_o} = \alpha \Delta T E$$

$$\sigma_{Temp} = \frac{B_x}{A_o}$$

So

$$\boxed{\sigma_{Temp} = \alpha \Delta T E}$$

$$\boxed{\sigma = E \epsilon}$$

$$\epsilon_{long} = \frac{0}{L} = 0$$