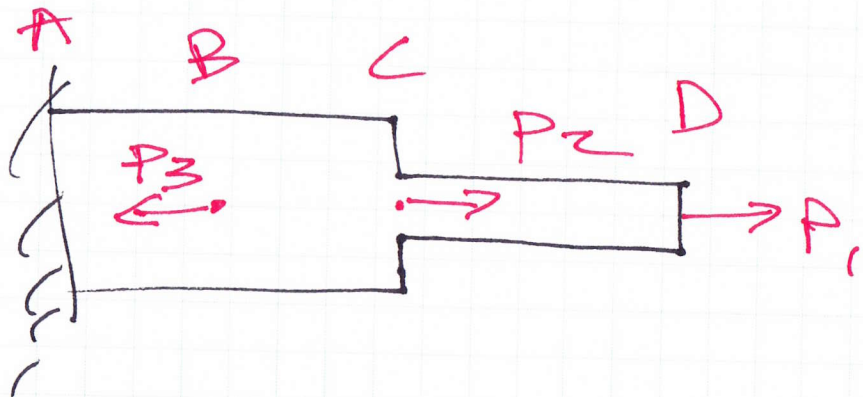


## Principle of Superposition

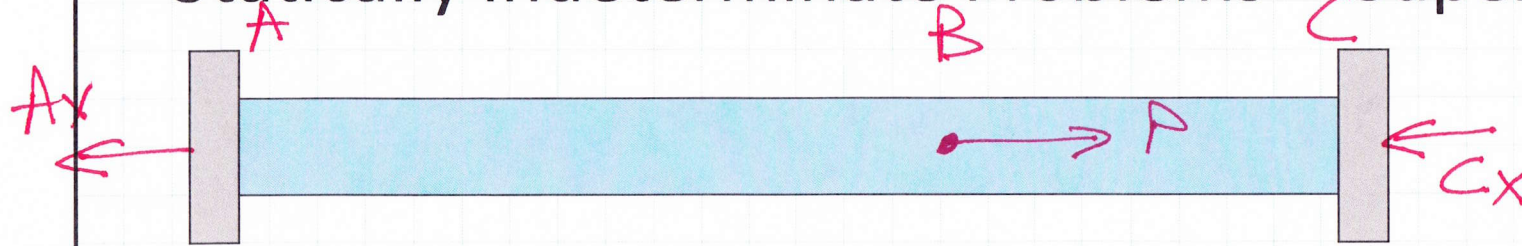
The total displacement or stress at a point in a structure can be determined by summing the displacements or stresses caused by each of the applied loads acting separately.



## Limitations

- material(s) must be linearly elastic.
- Small displacements

# Statically Indeterminate Problems -- SuperPosition



$$AE = \text{const}$$

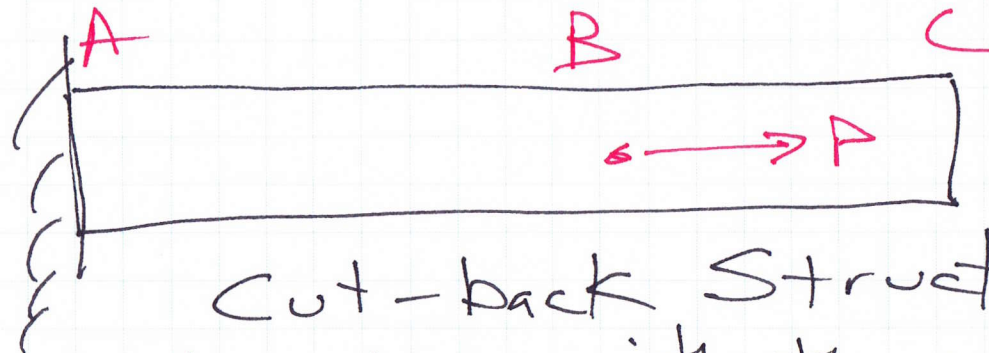
$$\rightarrow \sum F_x = 0$$

$$A_x + C_x = P$$

Identify the Redundant

choose Cx

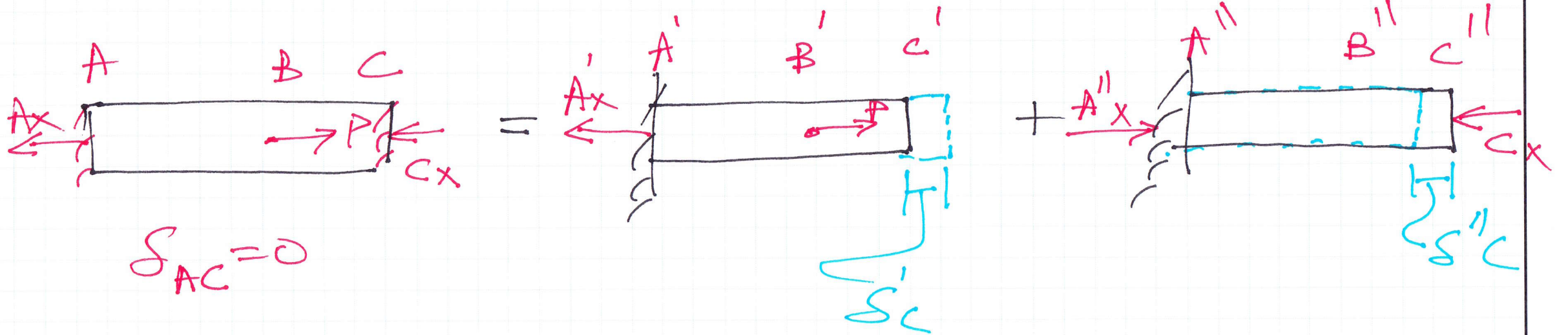
Indeterminate  
to the 1<sup>st</sup> degree



Cut-back Structure  
structure with the redundant  
removed.



Total Structure = Cut-back Structure with Real Loads + Cut-back structure with redundant.



$$\delta_{AC} = 0 = \delta'_C + \delta''_C$$

Solve for  $C_x$

$$A_x = A'_x + A''_x$$