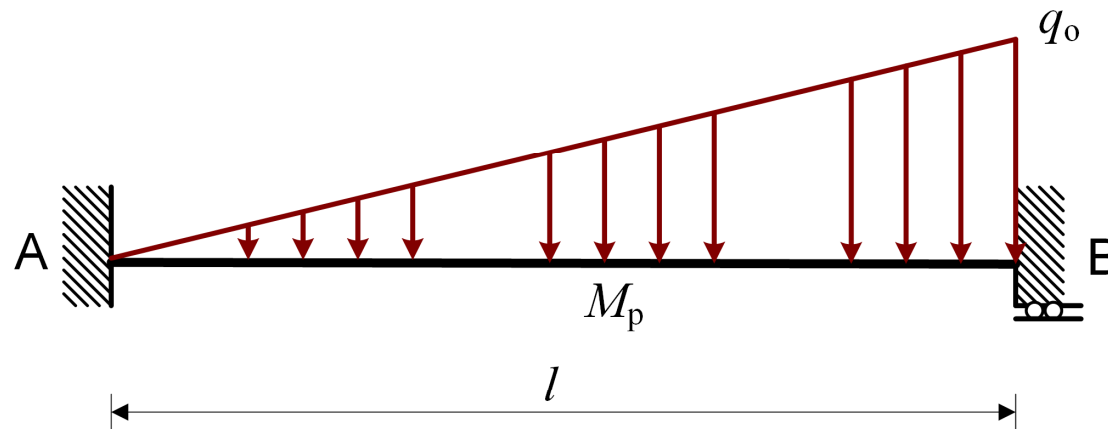


BEAM : FAILURE LOAD, INCREMENTAL METHOD



Questions: (use MAPLE to speed up calculations)

- Define the load stages (with static systems) needed to find the failure load with an incremental method
- Find the moment distributions for these static systems expressed in $q_0 l^2$.
- Find the failure load q_0 expressed in $\frac{M_p}{l^2}$ and the *load-deflection* diagram at midspan.

$$\frac{q_0 l^2}{M_p} = \text{value}$$

Hint:

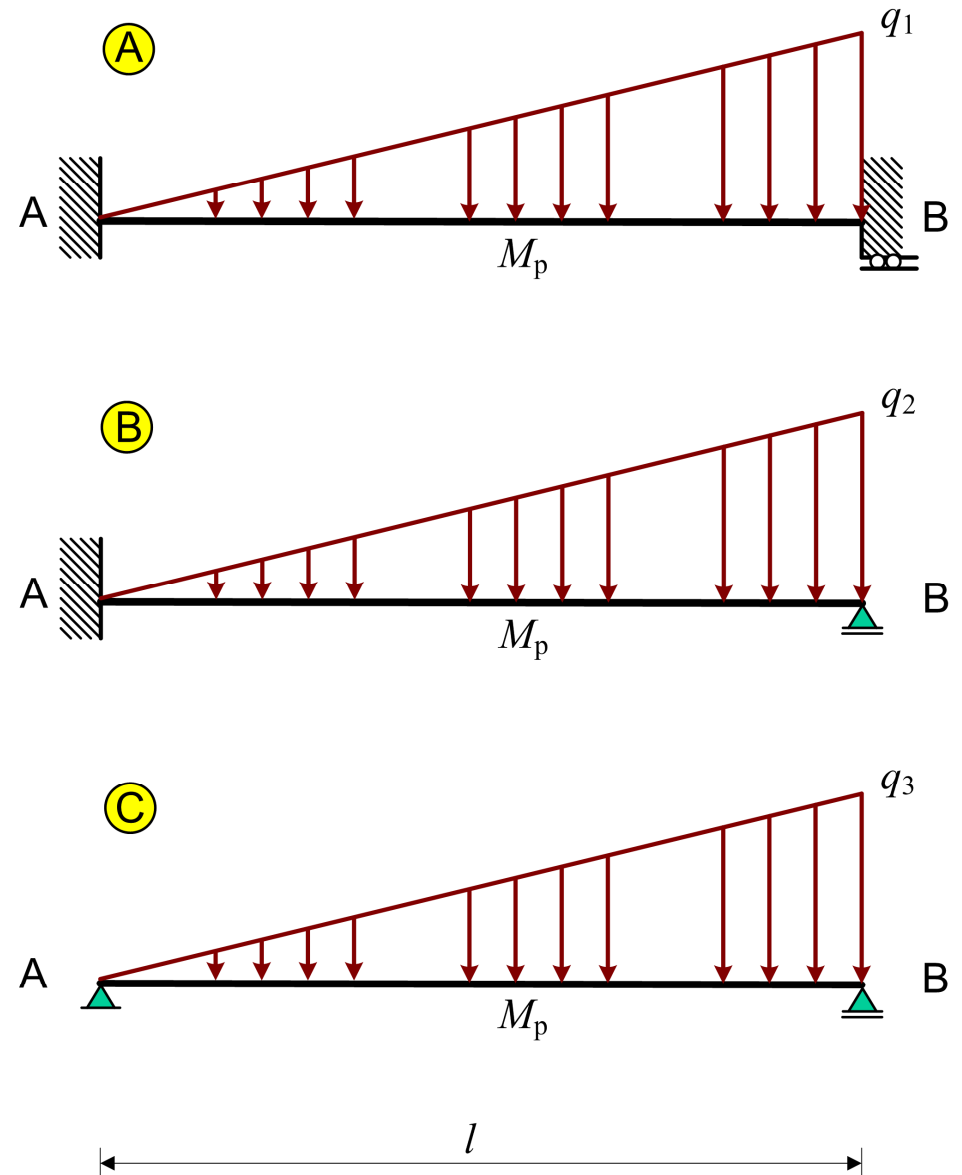
Three load cases to describe the stages of loading A, B and C. First plastic hinge occurs at B, then at A and then “somewhere” in the field.

Find for each load case the moment distribution.

For load case three find the value of the load which results in the third hinge.

Sum all load contributions for each stage to find the final failure load.

Pay attention to the available capacity of the cross section involved per load case.
(in plain English, some capacity is already used in the previous load stage)



Some help ...

