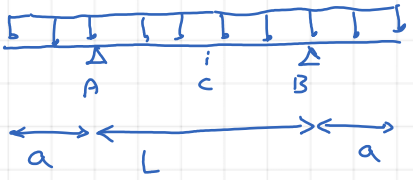
The video tutorial will provide a comprehensive analysis of a determinate beam and involve examining the beam's behavior under different loading conditions to determine favorable and unfavorable actions.



q_D, q_L

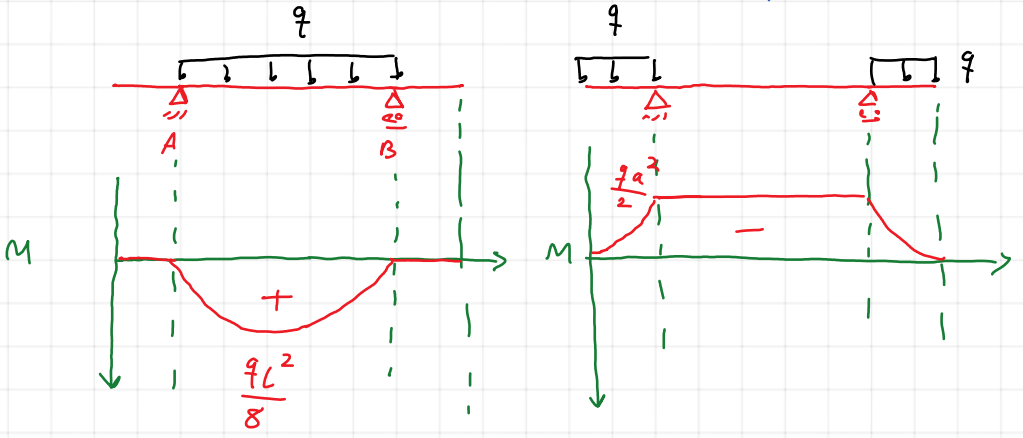
$M_C = ?$

$q_D = 10\ kN/m$

$q_L = 20\ kN/m$

$L = 5\ m$

$a = 1.5\ m$



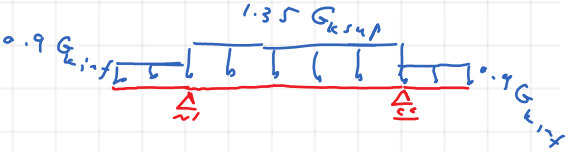
D. $q = 10\ kN/m$, $L = 5\ m$, $a = 1.5\ m$ →

$M_D^+ = \frac{qL^2}{8} = 31.25\ kN\,m$

$M_D^- = -\frac{qa^2}{2} = -11.25\ kN\,m$

$1.35\,G_{k\,sup} + 0.9\,G_{k\,inf} \rightarrow M_{Bc} = 1.35 \times 31.25\ kN\,m + 0.9\,(-11.25)\ kN\,m = 32.1\ kN\,m$

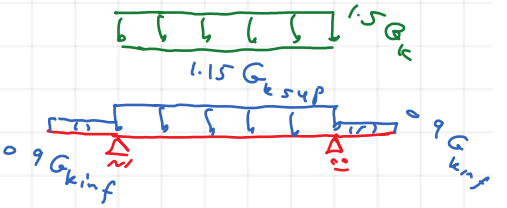
$31.25\ kN\,m - 11.25\ kN\,m = 20\ kN\,m \times 1.35 = 27\ kN\,m$



L: $q = 20\ kN/m$, $L = 5\ m$, $a = 1.5\ m$ →

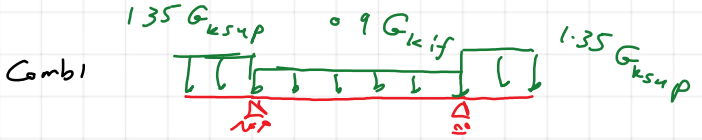
$M_L^+ = \frac{qL^2}{8} = 62.5\ kN\,m$

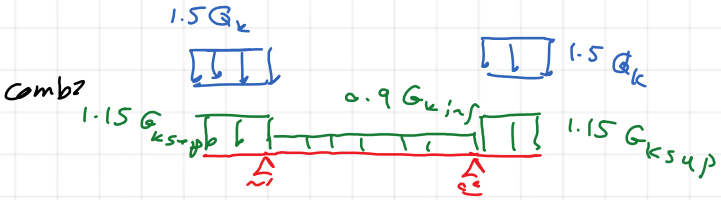
$M_L^- = -\frac{qa^2}{2} = -22.5\ kN\,m$



$1.15\,G_{k\,sup} + 0.9\,G_{k\,inf} + \sum \gamma_{Q,i} Q_{k,i}$

$M_{uls} = 1.15 \times 31.25\ kN\,m + 0.9\,(-11.25)\ kN\,m + 1.5 \times 62.5\ kN\,m + 0 \times (-22.5)\ kN\,m = 119.5\ kN\,m$





$$M_{Comb1} = 0.9\,(31.25)_{kN.m} + 1.35\,(-11.25)_{kN.m} = 12.94 \ kN.m$$

$$M_{Comb2} = 0.9\,(31.25)_{kN.m} + 1.15\,(-11.25)_{kN.m} + 1.5 \times (-22.5)_{kN.m} = -18.6 \ kN.m$$