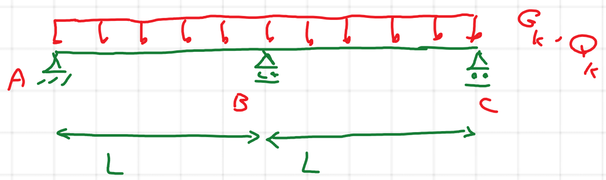
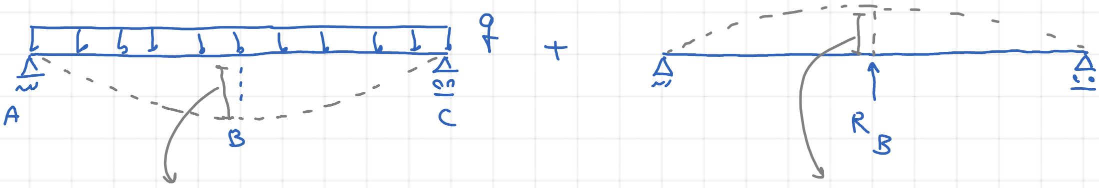
The previous video provided a comprehensive analysis of a determinate beam and involved examining the beam's behavior under different loading conditions to determine favorable and unfavorable actions.

In this video, the favorable and unfavorable load combinations will be determined for a two-span indeterminate beam.

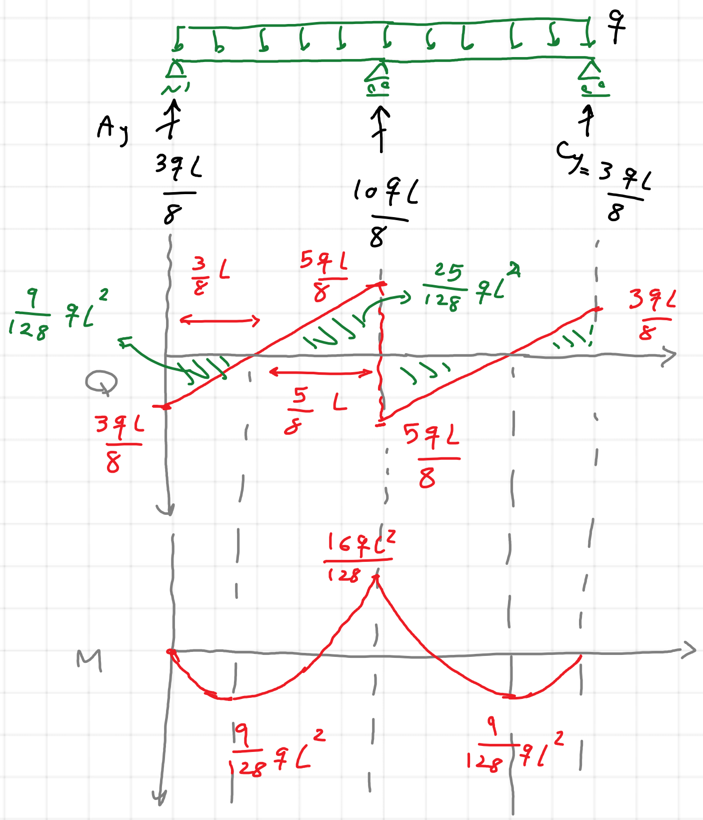




$$(\delta_B)_1 = \frac{5q(2L)^4}{384EI} \qquad (\delta_B)_2 = \frac{R_B(2L)^3}{48EI}$$

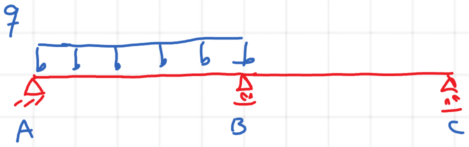
$$\delta_B = 0 \rightarrow (\delta_B)_1 \downarrow = (\delta_B)_2 \uparrow$$

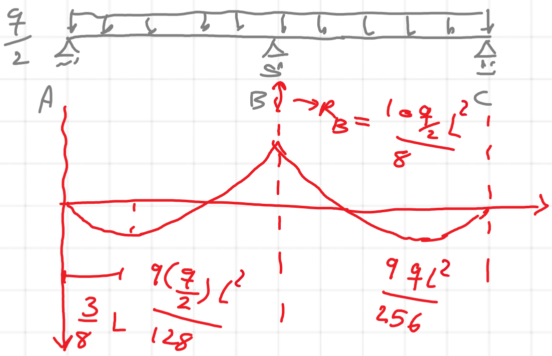
$$\frac{5q(2L)^4}{384EI} = \frac{R_B \cdot (2L)^3}{48EI} \rightarrow R_B = \frac{5qL}{4} = \frac{10qL}{8}$$



$$A_y = C_y = \left(q(2L) - \frac{10qL}{8}\right) \div 2$$

$$A_y = C_y = \frac{3qL}{8}$$

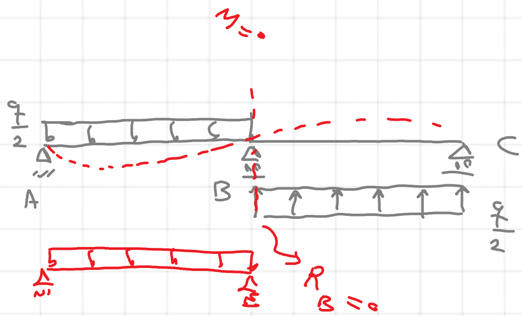




$$\underbrace{\frac{9qL^2}{256}}$$

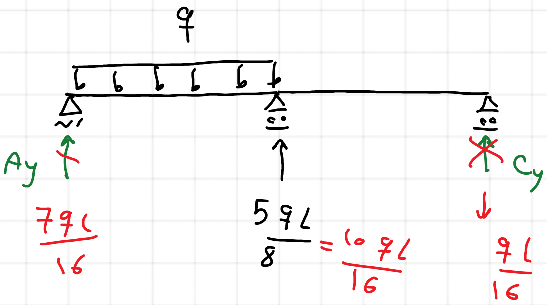
$$\left(R_B = \frac{10\,qL^2}{16}\right)$$

+



$$\frac{(q/2)(L)^2}{8}$$

$$\frac{qL^2}{16} \qquad (R_B = 0)$$

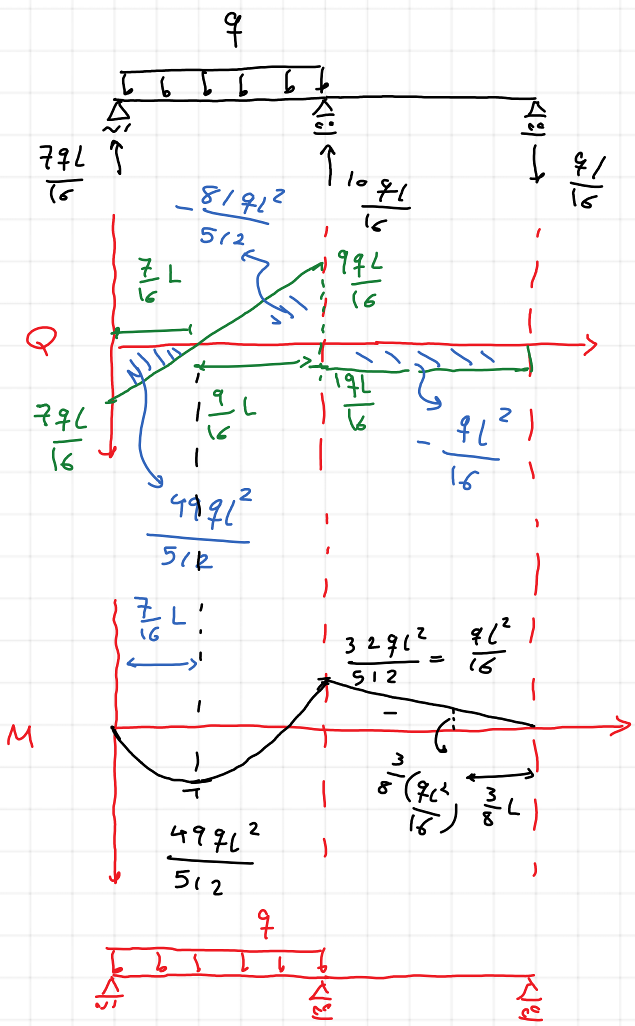


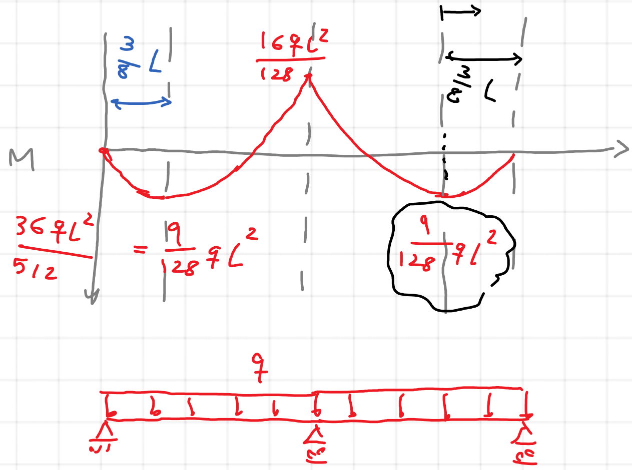
$$\overset{+}{\curvearrowleft} \Sigma M_A = 0 \longrightarrow qL \cdot \frac{L}{2} - \frac{5qL}{8} \cdot L - C_y\, 2L = 0$$

$$C_y = \frac{\left(\frac{1}{2} - \frac{5}{8}\right) \cdot qL}{2} = \frac{-qL}{16}$$

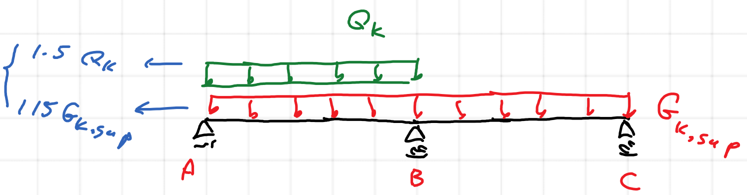
$$\Sigma F_y = \longrightarrow A_y - q \cdot L + \frac{10\,qL}{16} - \frac{qL}{16} = 0$$

$$A_y = \left(1 - \frac{10}{16} + \frac{1}{16}\right) \cdot qL = \frac{7qL}{16}$$

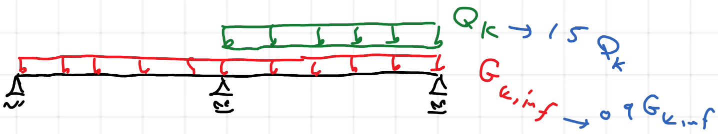




$M_{BC}^{(Max)}$



$M_{BC}^{(min)}$



$G_k = 10\ kN/m$

$Q = 20\ kN/m$

$L = 6m$

$$M_{BC}^{(unf)(max)} = 1.15 \times \frac{9\,(10\,\frac{kN}{m})\,(6\,m)^2}{128} + 1.5 \times \frac{49\,(20\,\frac{kN}{m})\cdot(6\,m)^2}{512} = 132.5\ kN\cdot m$$

$$M_{BC}^{(fa)\,min} = 0.9 \times \frac{9\,(10\,\frac{kN}{m})\,(6\,m)^2}{128} + 1.5 \times \frac{3}{8}\,\frac{(20\,kN/m)\,(6\,m)^2}{16} = -2.53\ kN\cdot m$$