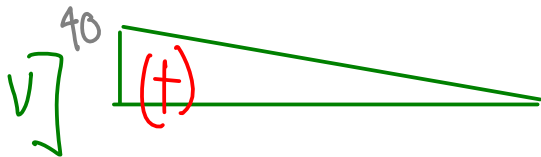
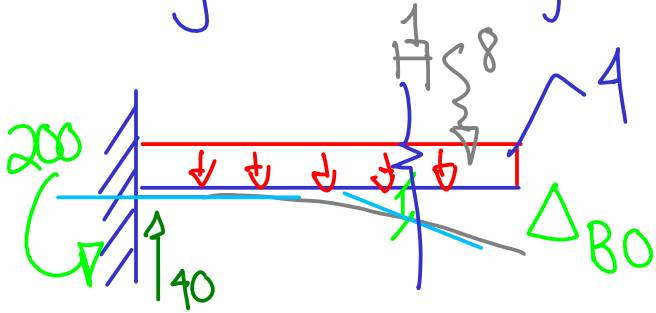


$$R, V, M, \delta_c$$

$$E = 29,000 \quad I = 180$$

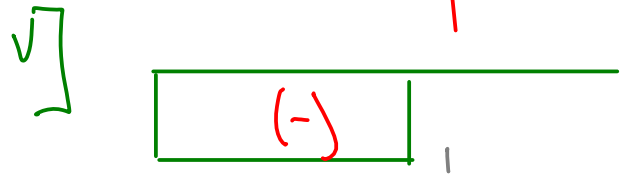
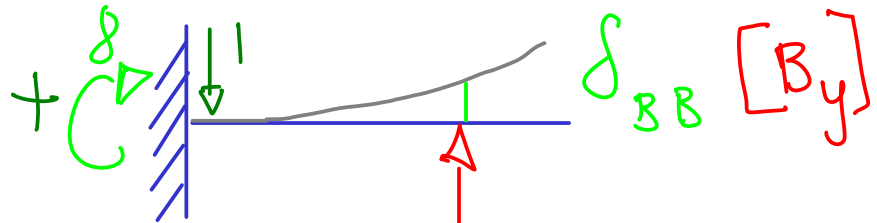
B_y será la fuerza redundante



$$M = \frac{M}{EI}$$

Bending moment diagram (M) for the beam ABC. The bending moment starts at 0 at A and increases to a maximum value of $\frac{200}{EI}$ at B. The area under the curve is labeled as positive (+).

$$-200 + \frac{1}{2} (10) (40) = 0$$



$$M = \frac{M}{EI}$$

Bending moment diagram (M) for the beam ABC. The bending moment starts at 0 at A and increases to a maximum value of 8 at B. The area under the curve is labeled as positive (+).

$$\frac{2}{3} \cdot 8 = \frac{16}{3}$$

$$t_{B/A} = \Delta_{B0} = \frac{1}{3} (10) \left(\frac{200}{EI} \right) \left(\frac{3}{4} \cdot 10 - 2 \right) - \frac{1}{3} (2) \left(\frac{8}{EI} \right) \left(\frac{1}{4} \cdot 2 \right)$$

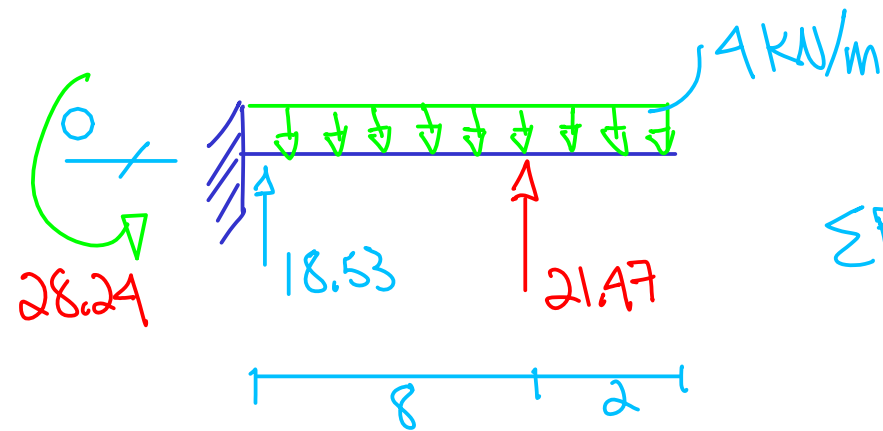
$$= \frac{366A}{EI}$$

$$\delta_{BB} = \frac{1}{2} (8) \left(\frac{8}{EI} \right) \left(\frac{16}{3} \right) = \frac{512}{3EI}$$

Ec. de compatibilidad

$$\Delta_{B0} + \delta_{BB} B_y = 0$$

$$\frac{3664}{EI} - \frac{512}{3EI} B_y = 0 \quad B_y = \underline{21.47 \text{ kN}}$$

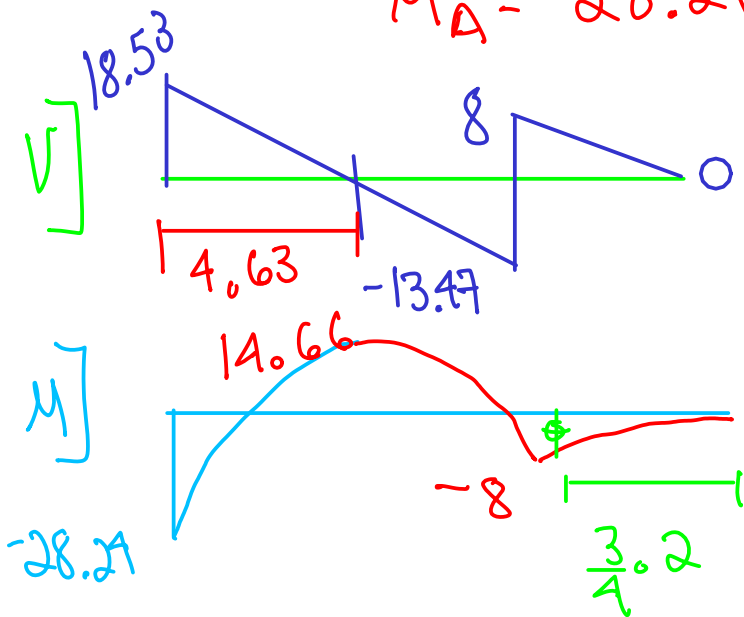


$$\sum F_y = -4(10) + 21.47 + A_y = 0$$

$$A_y = 18.53 \text{ kN}$$

$$\sum M_A = (4)(10)(5) - 21.47(8) - M_A = 0$$

$$M_A = 28.24 \text{ kNm}$$



$$18.53 - 4(x) = 0$$

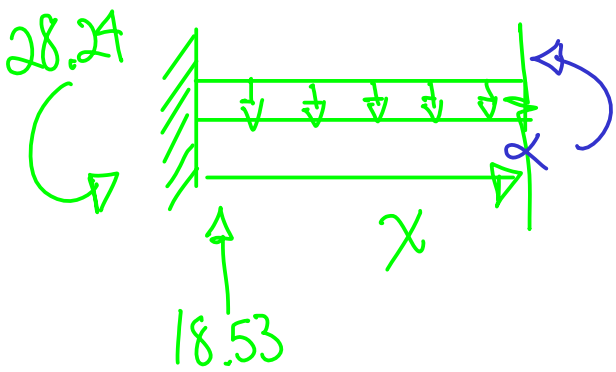
$$x = 4.63$$

$$-28.24 + \frac{1}{2}(4.63)(18.53) = 14.66$$

$$14.66 - \frac{1}{2}(8-4.63)(13.47) = -8$$

$$-8 + \frac{1}{2}(2)(8) = 0$$

$$\frac{1}{3}(2)\left(\frac{8}{EI}\right)\left(\frac{3}{4}\cdot 2\right) = 8$$



$$\sum M_x = M_x + 28.24 + \frac{4x^2}{2} - 18.53x = 0$$

$$M_x = -2x^2 + 18.53x - 28.24$$

Doble integración

Condiciones de frontera

$$\theta_A = 0 \quad \delta_A = 0$$

$$EI\theta \rightarrow \int M(x) \rightarrow \frac{-2x^3}{3} + \frac{18.53x^2}{2} - 28.24x + C_1 = 0$$

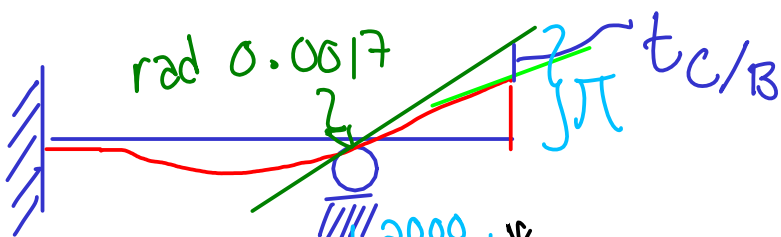
$$\text{Si } x=0; \theta=0 \therefore C_1=0$$

$$EI\theta = \frac{-2x^3}{3} + \frac{18.53x^2}{2} - 28.24x$$

Rotación en B

$$EI\theta_{(8\text{ m})} = \frac{-2(8^3)}{3} + \frac{18.53(8)^2}{2} - 28.24(8) = 25.7$$

$$\theta_{8\text{ m}} = \frac{25.7 \text{ kNm}^2}{EI} = \frac{25.7 \text{ kNm}^2}{29000 \text{ ksi} \cdot 180 \text{ in}^4} = 0.0017 \text{ rad}$$



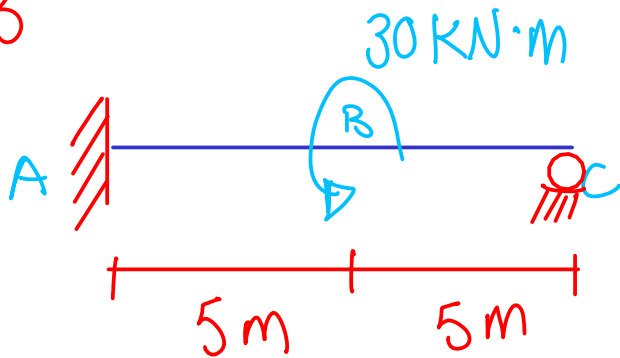
$$t_{C/B} = \frac{8^3}{EI} = \frac{8 \text{ kNm}^3}{29000 \text{ ksi} \cdot 180 \text{ in}^4} = 0.534 \text{ mm}$$

$$\pi = (0.0017 \text{ rad}) (2000 \text{ mm}) = 3.4 \text{ mm}$$

$$\tan \theta \approx \theta$$

$$\delta_c = 3.4 \text{ mm} - 0.534 \text{ mm} = 2.866 \text{ mm}$$

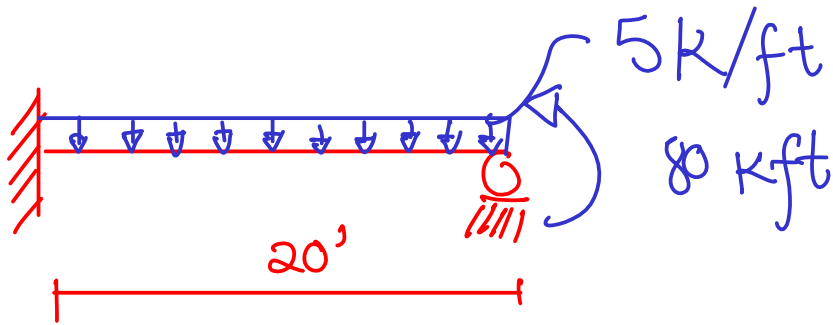
11.3



R, V, M

$EI = \text{cte}$

11.4



R, V, M

$EI = \text{cte}.$