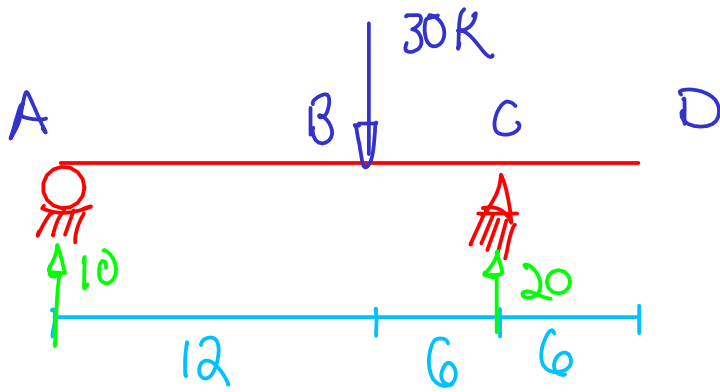


Método de la Viga Conjugada

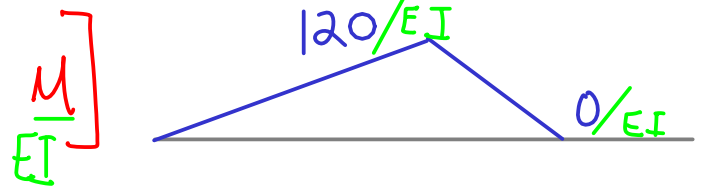
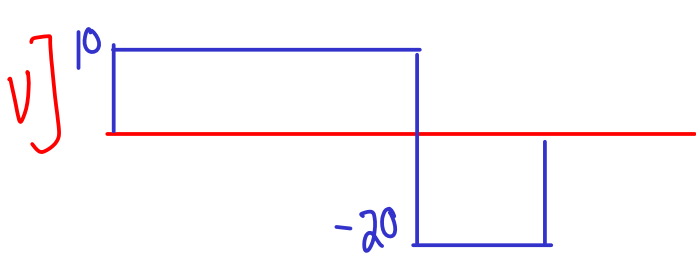


$$\int M \dot{c} x_{A-C} = d?$$

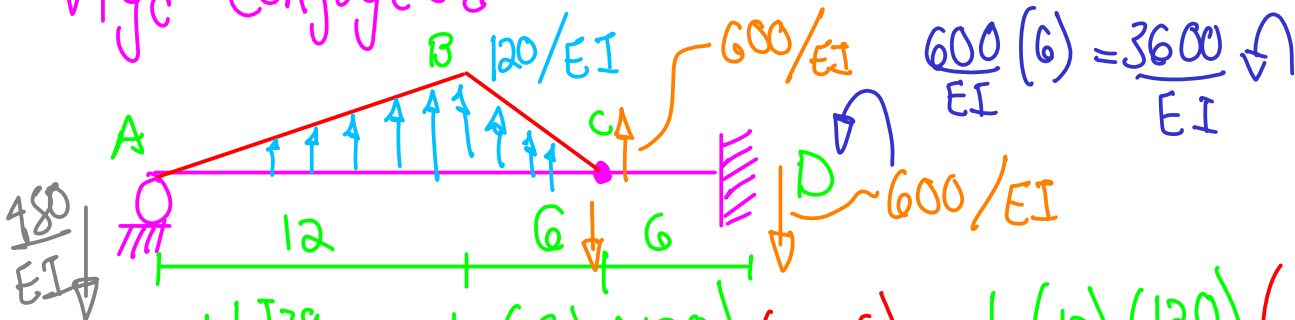
$$\delta_D = d?$$

$$\sum M_A = 30(12) - C_y(18) = 0 \quad \therefore C_y = 20 \text{ k } \uparrow$$

$$\sum F_y = A_y + 20 - 30 = 0 \quad \therefore A_y = 10 \text{ k } \uparrow$$



Viga Conjugada



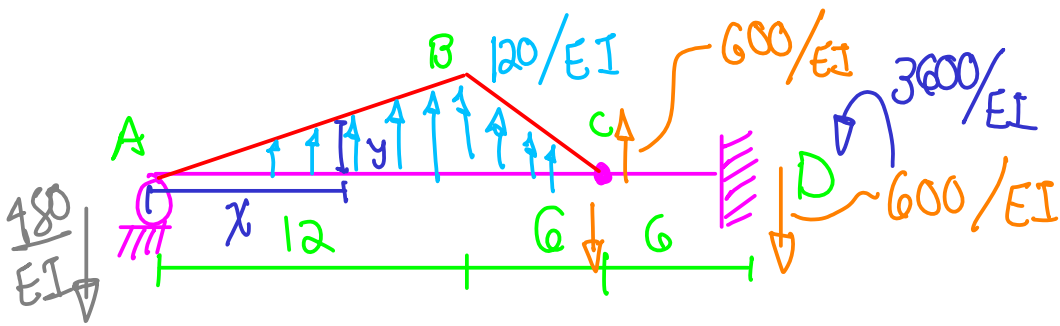
$$\sum M_C^{LJ29} = \frac{1}{2} (6) \left(\frac{120}{EI} \right) \left(\frac{2}{3} \cdot 6 \right) + \frac{1}{2} (12) \left(\frac{120}{EI} \right) \left(\frac{1}{3} \cdot 12 + 6 \right)$$

$$- A_y (18) = 0$$

$$A_y = \frac{480}{EI} \downarrow$$

$$\sum F_y = -\frac{480}{EI} - C_y + \frac{1}{2} (12) \left(\frac{120}{EI} \right) + \frac{1}{2} (6) \left(\frac{120}{EI} \right) = 0$$

$$C_y = \frac{600}{EI}$$

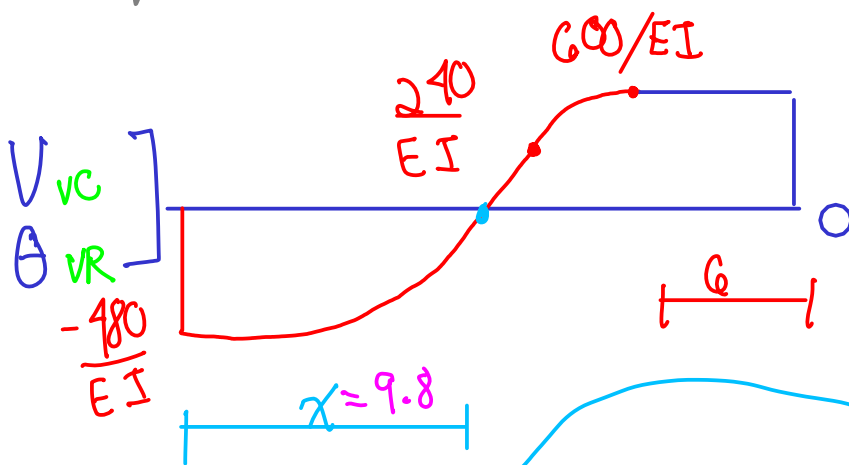


$$y = mx + b$$

$$\frac{120}{12}x + 0 = 10x$$

$$-\frac{480}{EI} + \frac{1}{2}(12)\left(\frac{120}{EI}\right) = \frac{240}{EI}$$

$$\frac{240}{EI} + \frac{1}{2}(6)\left(\frac{120}{EI}\right) = \frac{600}{EI}$$



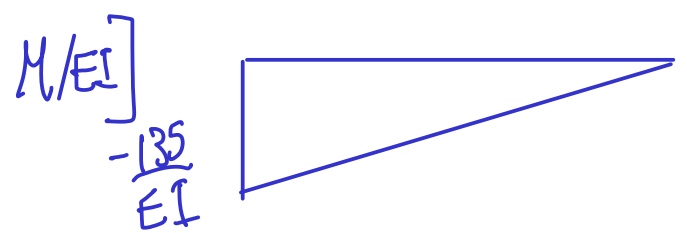
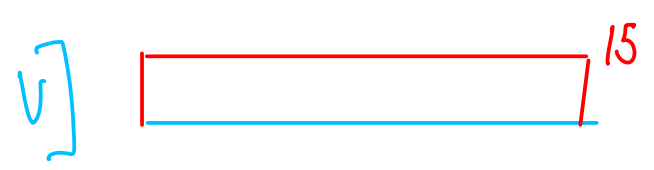
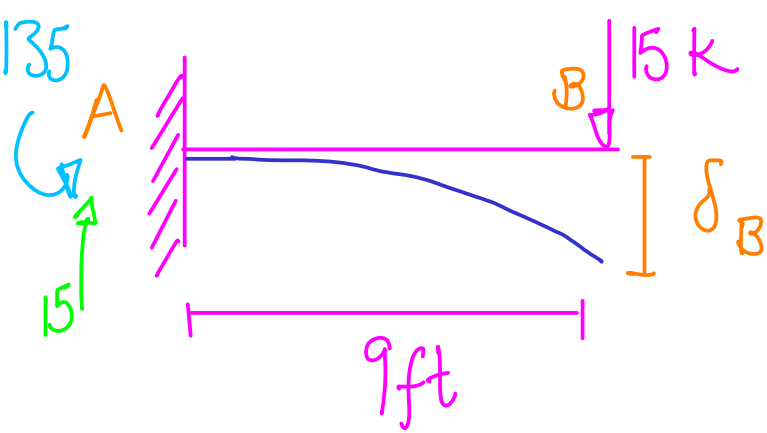
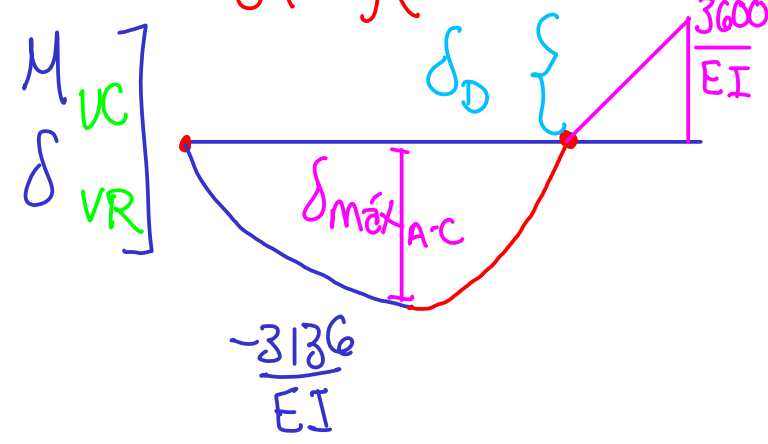
$$\frac{480}{EI} = \frac{1}{2}xy$$

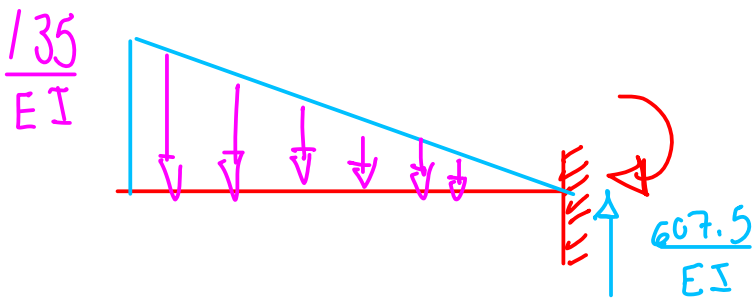
$$\frac{y}{120} = \frac{x}{12} \quad y = 10x$$

$$\frac{480}{EI} = \frac{1}{2}x(10x)$$

$$\frac{480}{EI} = 5x^2 \quad \therefore x = 9.8$$

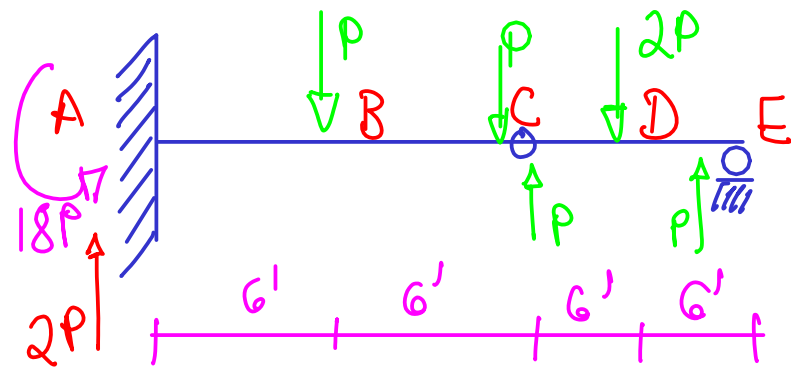
$$\frac{2}{3}(9.8)\left(\frac{480}{EI}\right) = -\frac{3136}{EI}$$





$$\sum F_y = -\frac{135}{EI} \left(\frac{1}{2} \cdot 9 \right) + B_y = 0 \quad \therefore B_y = \frac{607.5}{EI} = \theta_B$$

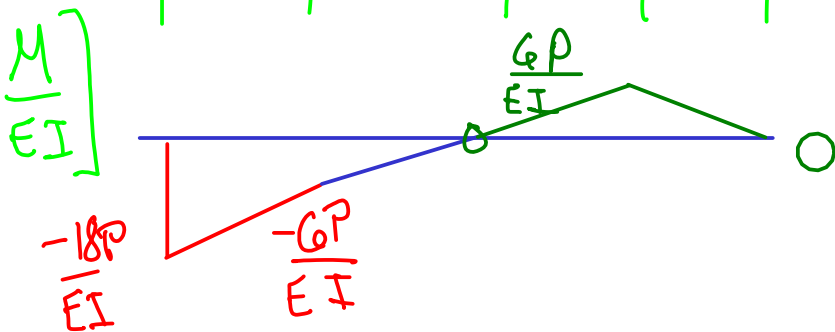
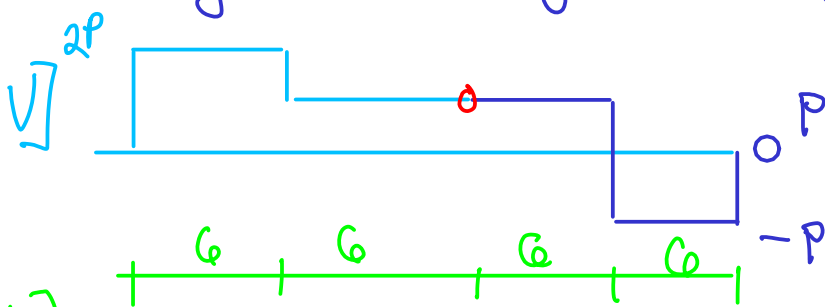
$$\sum M_B = \frac{1}{2} (9) \left(\frac{135}{EI} \right) \left(\frac{2}{3} \cdot 9 \right) - M_B = 0 \quad \therefore M_B = \frac{3645}{EI} = \delta_B$$



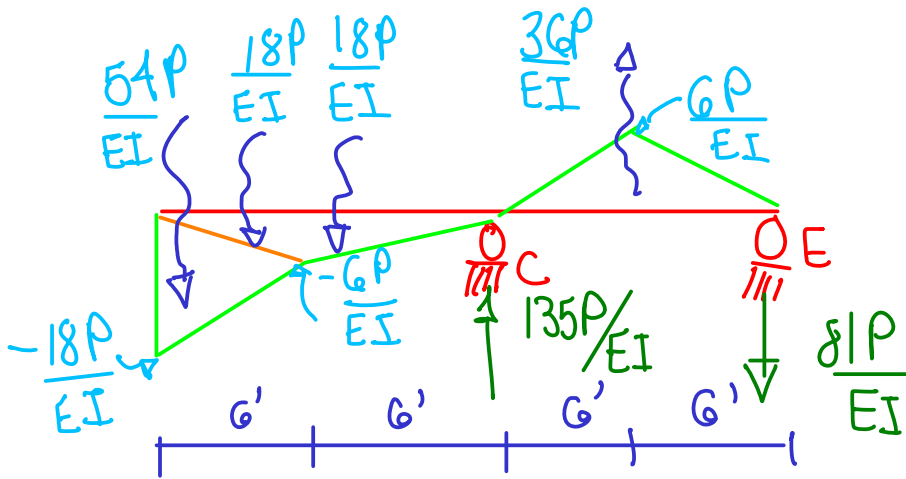
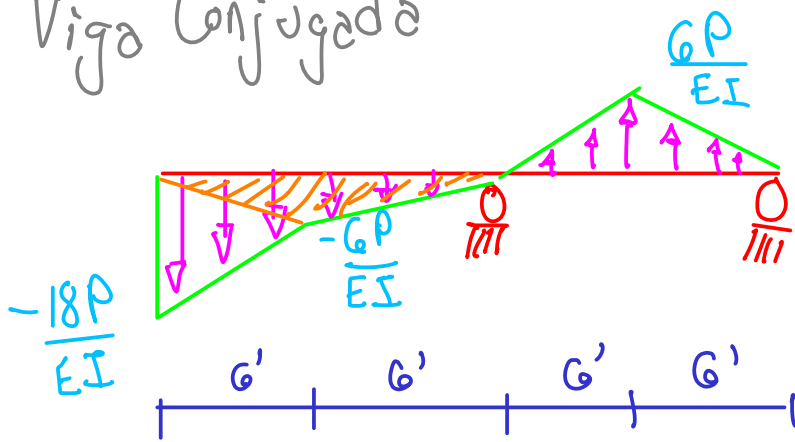
$\delta_{max} = d?$

$$\sum M_{I_2O} = M_A - P(6) - P(12) \rightarrow M_A = 18P$$

$$\sum F_y = -P - P + A_y = 0 \quad \therefore A_y = 2P \uparrow$$



Viga Conjugada



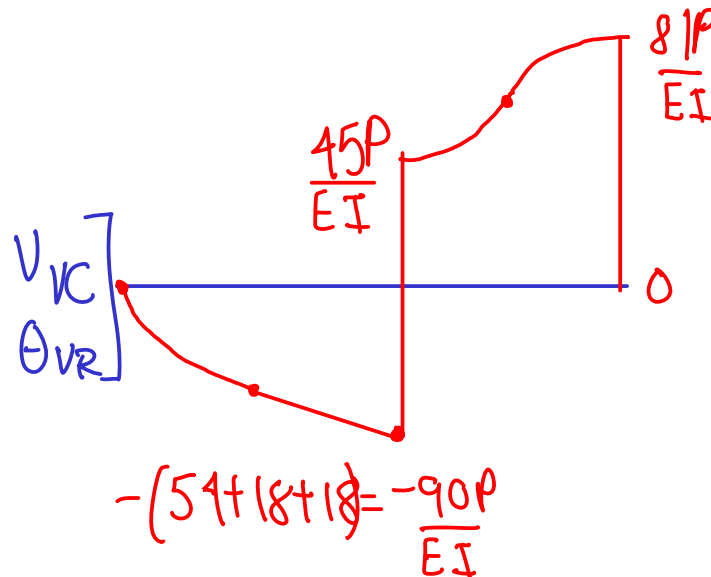
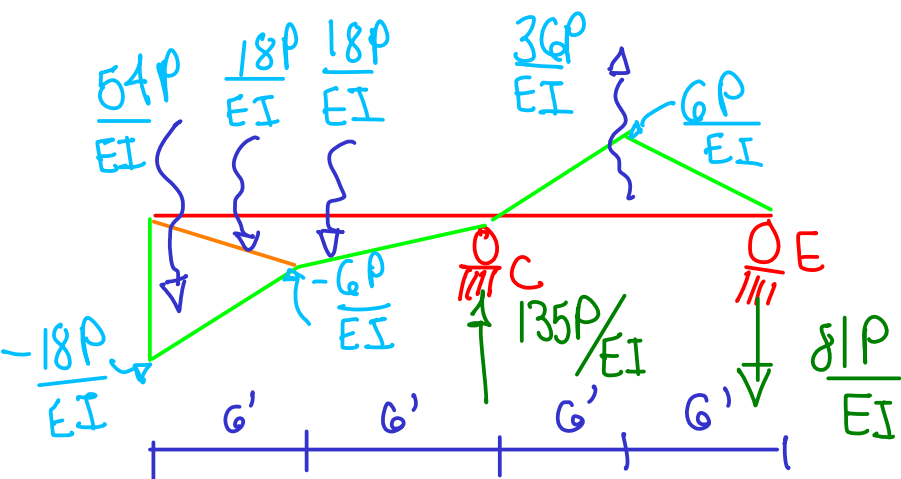
$$\frac{1}{2}(6)(18) = \frac{54}{EI}$$

$$\frac{1}{2}(6)\left(\frac{6}{EI}\right) = \frac{18}{EI}$$

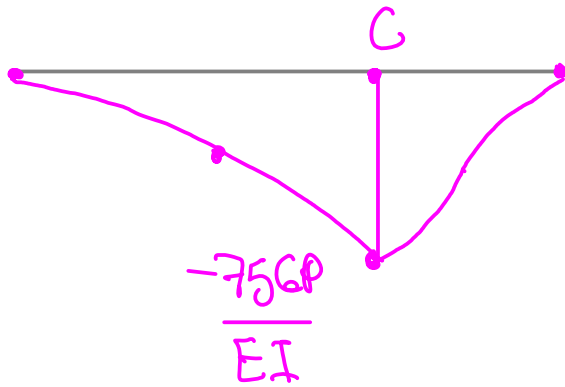
$$\sum M_C = \frac{36P}{EI}(6') + \frac{18P}{EI}\left(\frac{2}{3} \cdot 6\right) + \frac{18P}{EI}\left(6 + \frac{1}{3} \cdot 6\right) + \frac{54P}{EI}\left(6 + \frac{2}{3} \cdot 6\right)$$

$$- E_y(12) = 0 \quad E_y = \frac{81P}{EI} \downarrow$$

$$\sum F_y = -\frac{54P}{EI} - \frac{18P}{EI} - \frac{18P}{EI} + \frac{36P}{EI} - \frac{81P}{EI} + C_y = 0 \therefore C_y = \frac{135P}{EI} \uparrow$$



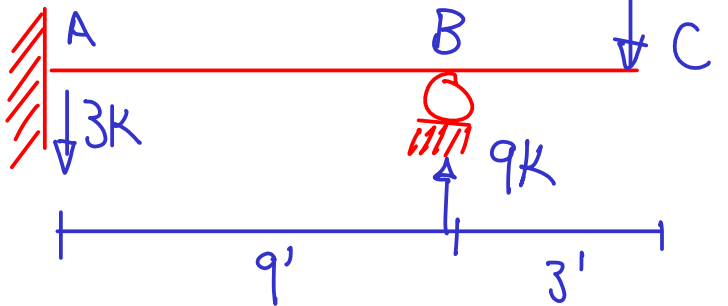
M_{vc}
 δ_{vr}



$$\Sigma M_c = 18\left(\frac{2}{3} \cdot 6\right) + 18\left(6 + \frac{1}{3} \cdot 6\right) + 54\left(6 + \frac{2}{3} \cdot 6\right) \Rightarrow \frac{756P}{EI}$$

$$\delta_{m\acute{o}x} = \frac{-756P}{EI}$$

9 kft



Calcule la pendiente y la deflexión en el punto C, así como la deflexión máxima entre A y B.

Se dan las reacciones.
El es constante.