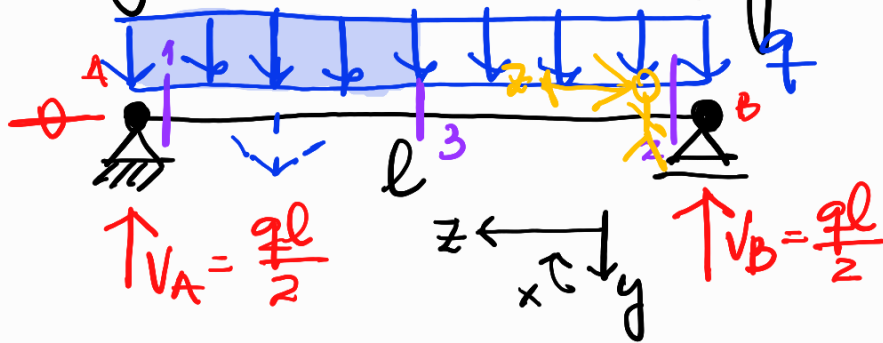
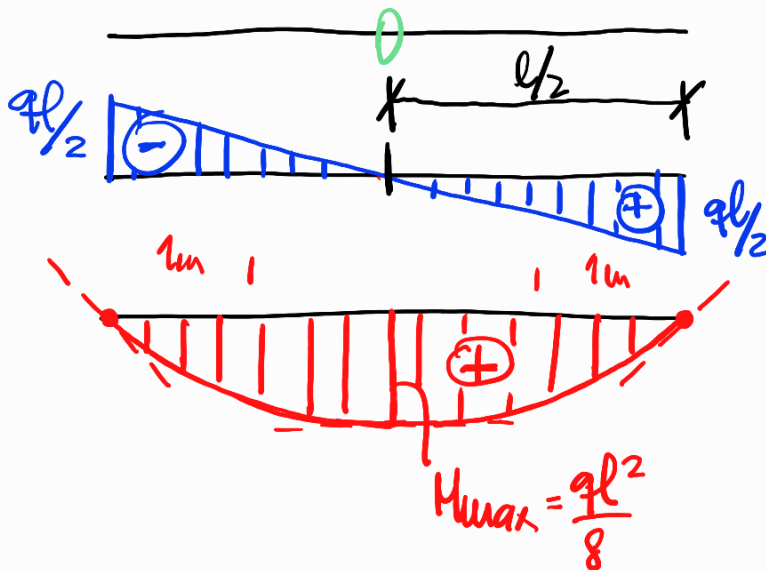


Viga simplemente apoyada con carga distribuida



$$\sum M^A = 0 = q \frac{l^2}{2} - V_B l$$

$$V_B = q \frac{l}{2}$$



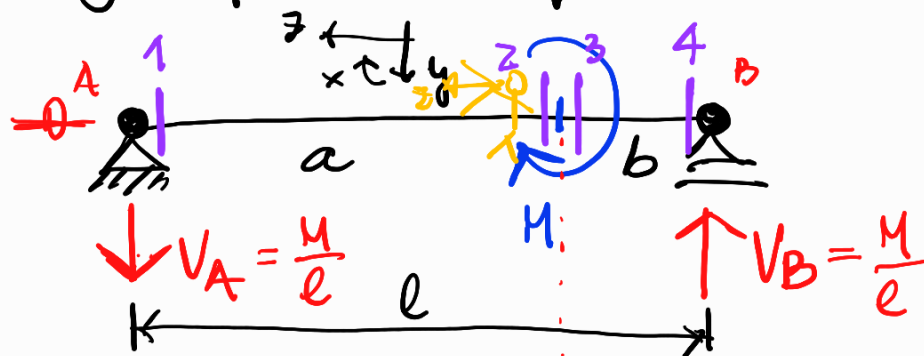
$$① [k] \quad \frac{dV}{dz} = -q$$

$$② [k] \quad \frac{d\phi}{dz} = -q$$

$$③ [kNm] \quad \frac{dM}{dz} = \phi$$

$$M_{max} = + \frac{q l}{2} \frac{l}{2} - \frac{q l}{2} \frac{l}{4} = \frac{q l^2}{8}$$

Viga simplemente apoyada con un momento

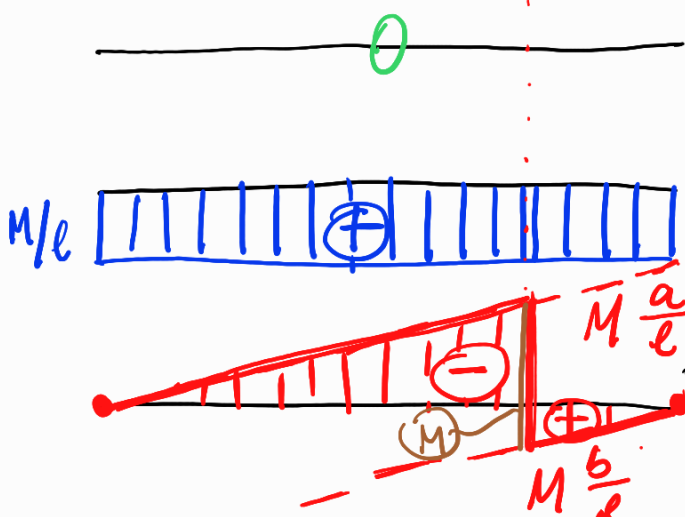


$$\sum M^A = 0 = M - V_B l$$

$$V_B = \frac{M}{l}$$

$$\sum F_y = 0 = V_A - \frac{M}{l}$$

$$V_A = \frac{M}{l}$$

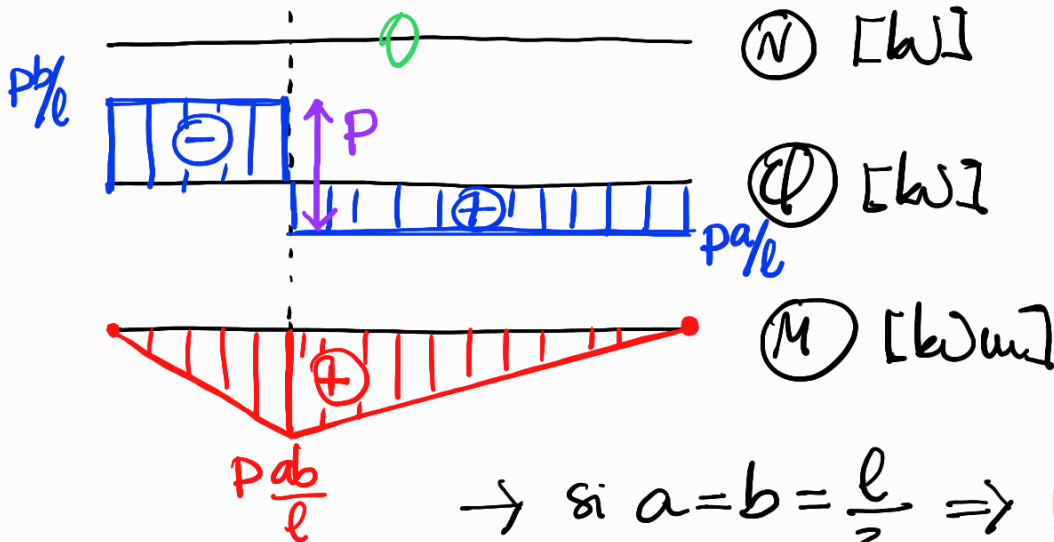
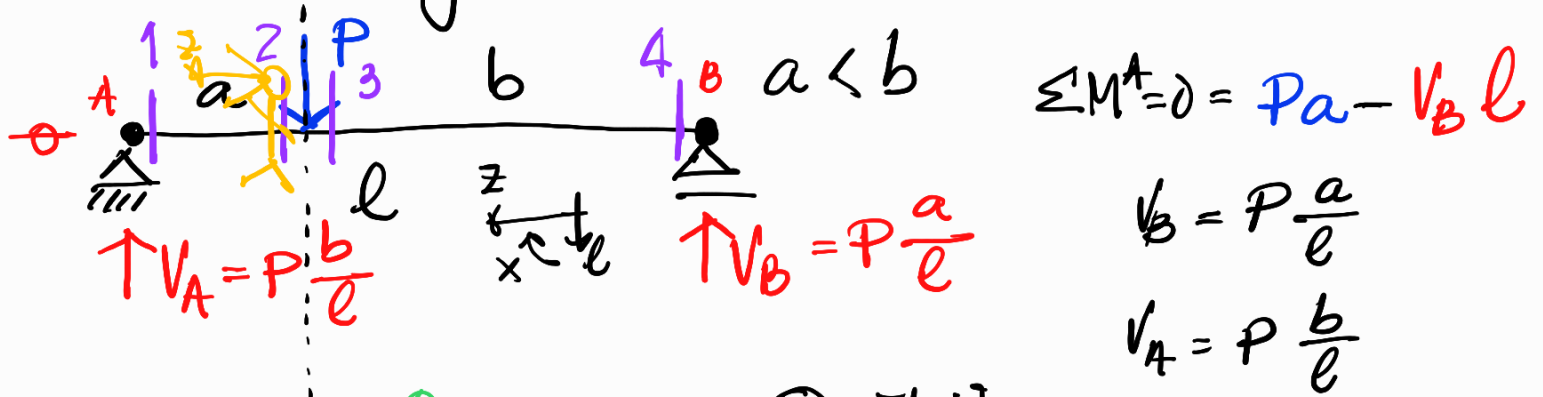


$$① [k] \quad V_A = \frac{M}{l}$$

$$② [k] \quad$$

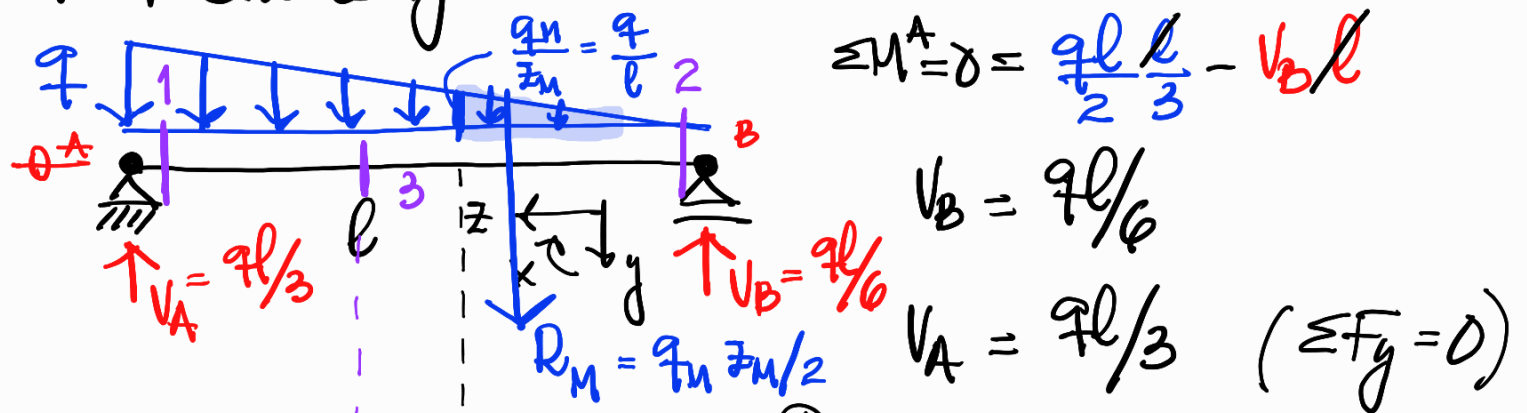
$$③ [kNm] \quad$$

VSA con carga descentrada



$$\rightarrow \text{si } a=b=\frac{l}{2} \Rightarrow M_{\max} = P \frac{\frac{l}{2} \frac{l}{2}}{\frac{l}{2}} = P \frac{l}{4}$$

VSA con carga lineal

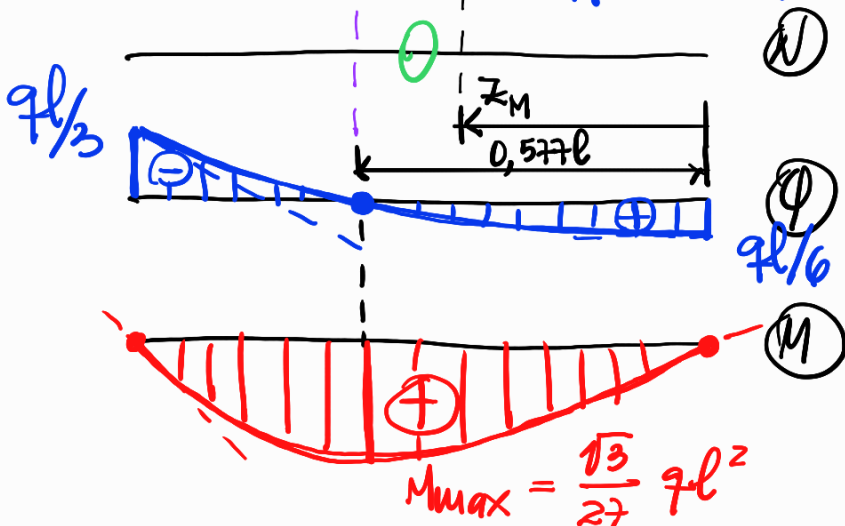


$$\frac{d\theta}{dz} = -q_y \quad R_1 = V_B$$

$$q_0 \frac{z_M}{2} = \frac{q_0 l}{6}$$

$$\left(\frac{q_0}{l} z_M\right) \frac{z_M}{2} = \frac{q_0 l}{6}$$

$$\frac{q_0}{2l} z_M^2 = \frac{q_0 l}{6} \rightarrow z_M = \sqrt{\frac{l^2}{3}} = 0.577l$$

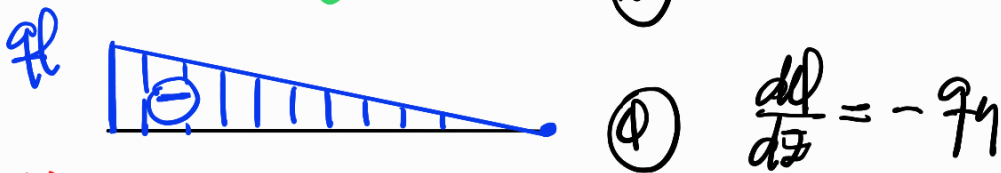
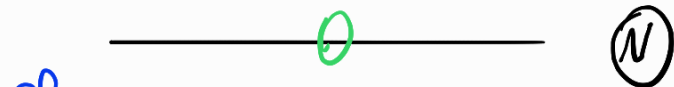
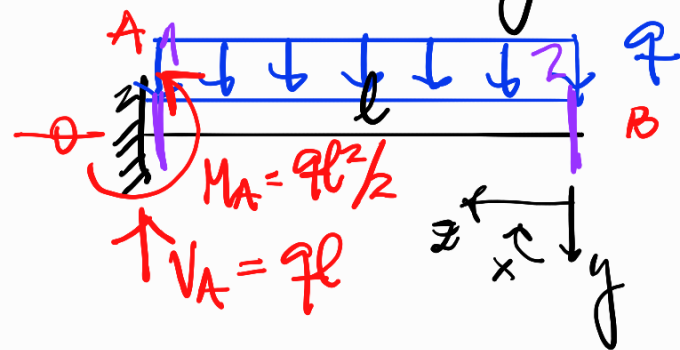


$$M_{max} = - \left(\frac{ql}{6} \cdot \frac{l}{\sqrt{3}} + \frac{q}{\sqrt{3}} \frac{l}{\sqrt{3}} \frac{1}{2} \frac{l}{3\sqrt{3}} \right) + \frac{ql^2}{\sqrt{3}} \left(-\frac{1}{6} + \frac{1}{18} \right)$$

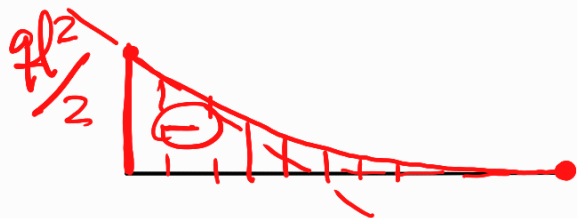
$$- \frac{2}{18} = -\frac{1}{9}$$

$$M_{max} = \frac{ql^2}{\sqrt{3} \cdot 9} = ql^2 \frac{\sqrt{3}}{27}$$

manera con carga distribuida uniforme



$$\frac{dQ}{dz} = -q$$



$$\frac{dM}{dz} = Q$$

H. Cuerpo Rígido

H. L. Estática

Sup. de Efectos



