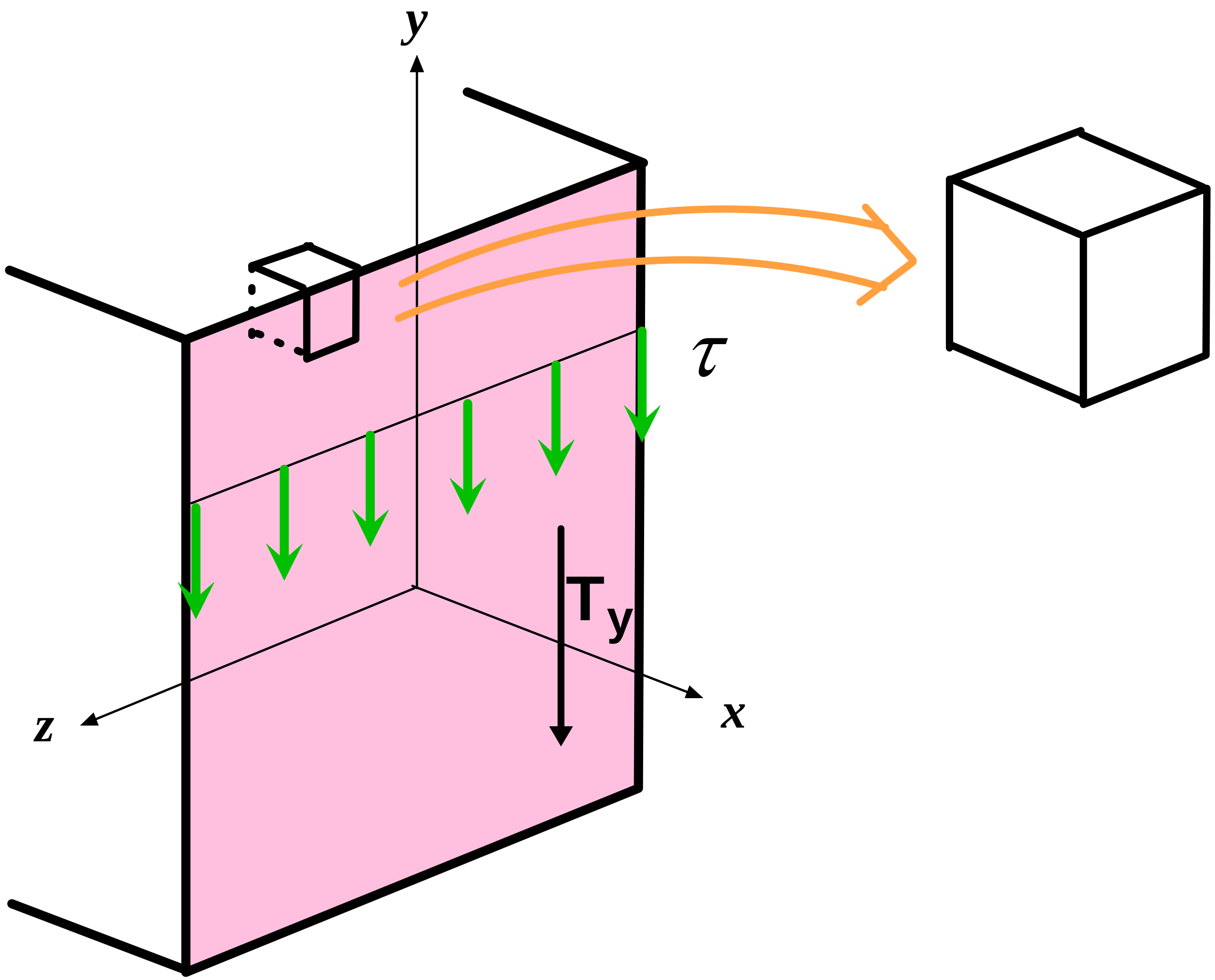
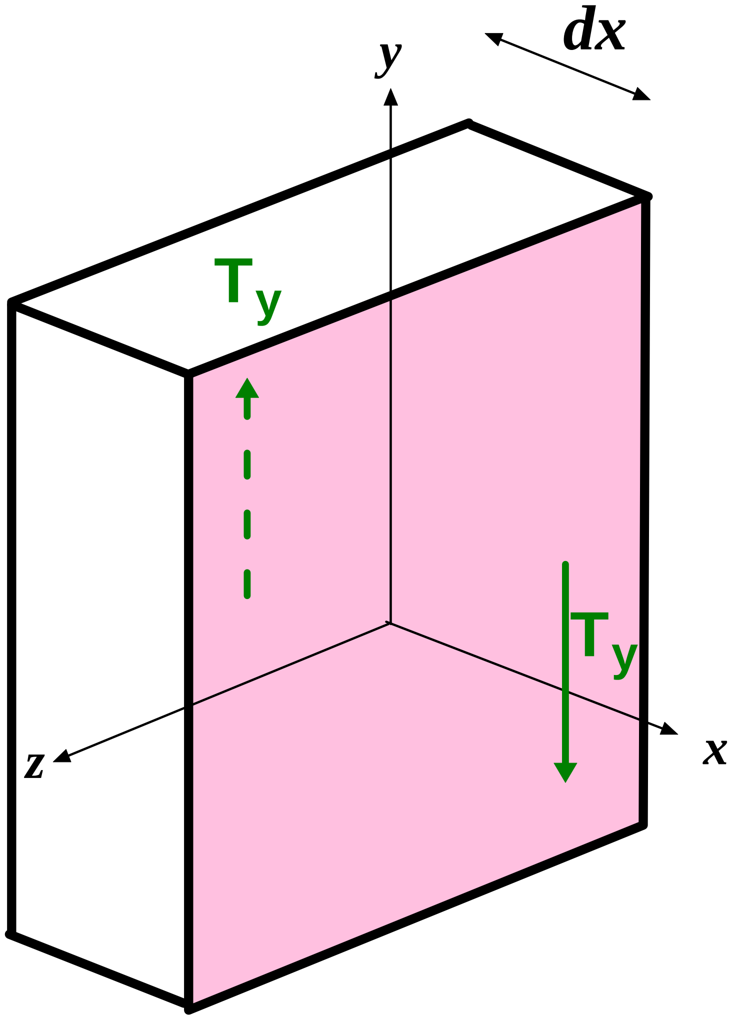
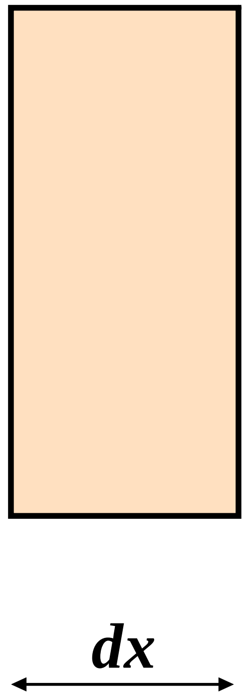
TENSIONES CORTANTES (Debidas a T_y):

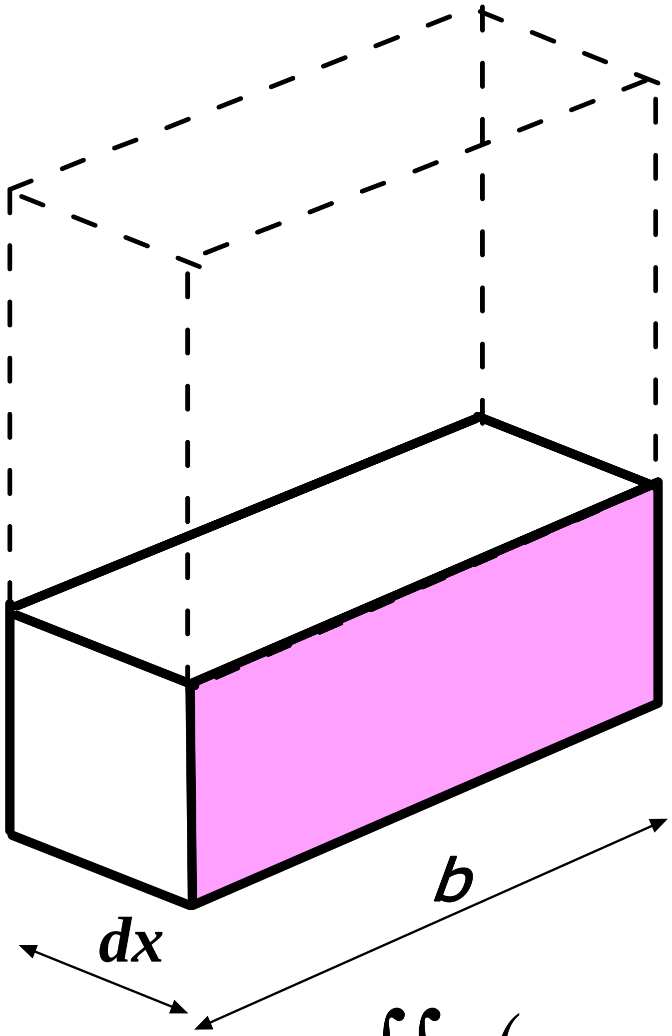


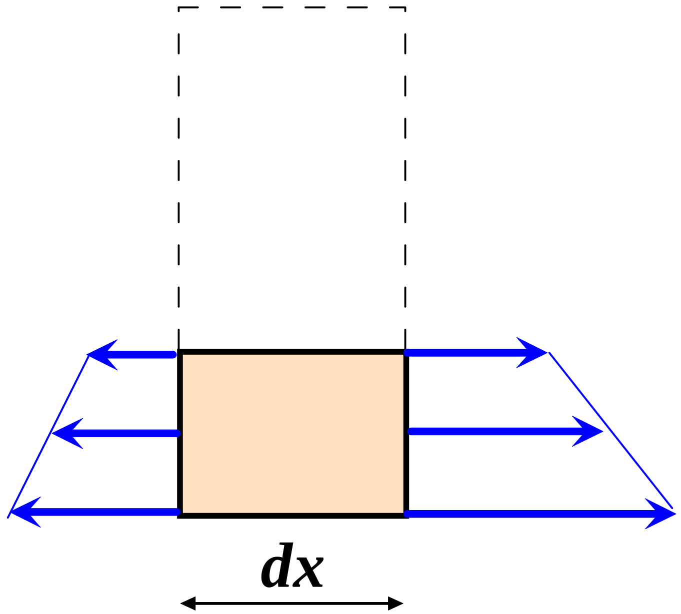
Limitación: T_y constante, sección constante





AISLAMIENTO PORCIÓN INFERIOR





Equilibrio de fuerzas en x

$$\sum F_x = 0$$

$$\iint_{A''} \Big(\qquad \Big) dA - \qquad = 0$$

$$\iint_{A''} d\sigma_x \, dA - \tau \cdot b \cdot dx = 0$$

$$\sigma_x = -\frac{M_z(x)}{I_z} y \rightarrow d\sigma_x = - \left(\frac{M_z(x)}{I_z} y \right) dx = -\frac{y}{I_Z} \frac{dM_z(x)}{dx} dx$$

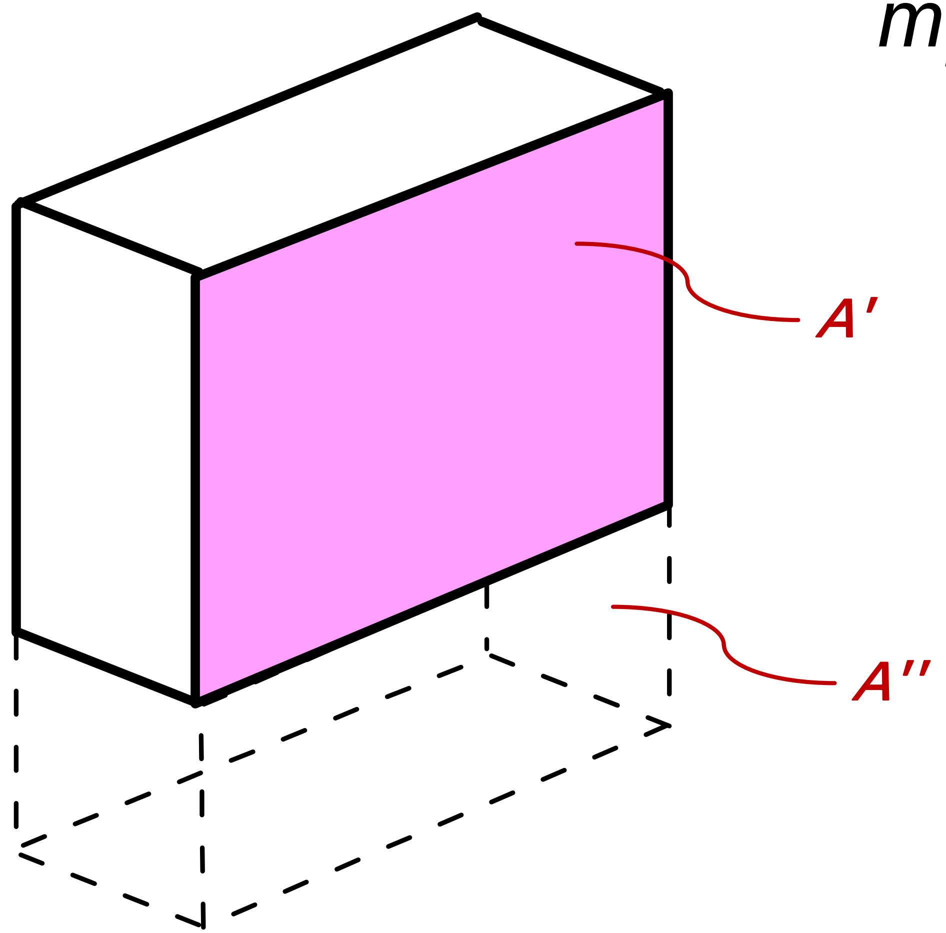
$$\iint_{A''} -\frac{T_y}{I_Z} dx \cdot y dA - \tau \cdot b \cdot dx = 0$$

$$-\frac{T_y}{I_Z} dx \iint_{A''} y dA - \tau \cdot b \cdot dx = 0$$

$$\tau(y) = -\frac{T_y \cdot m_{z\,A''}(y)}{b \cdot I_Z}$$

Colignon-Žuravski

AISLAMIENTO PORCIÓN SUPERIOR

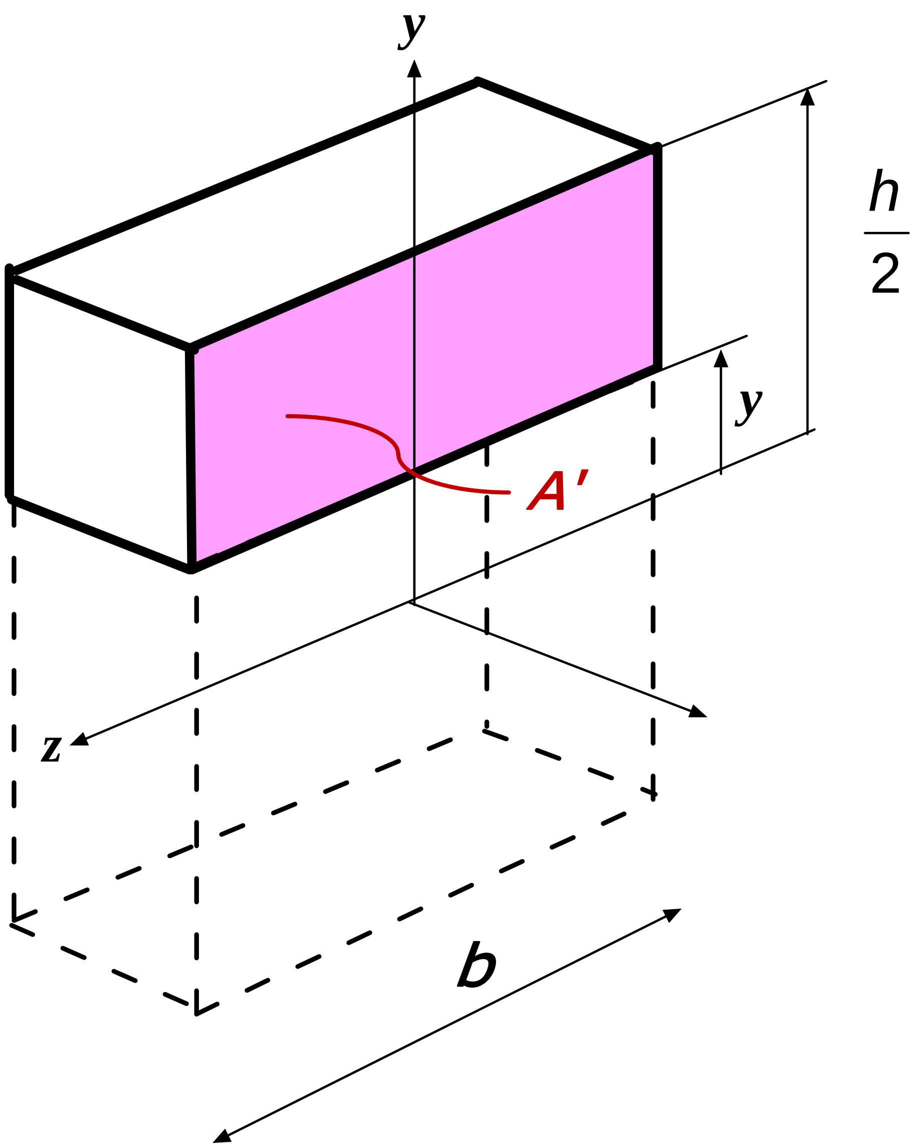


$$m_z = 0 \rightarrow m_{z\,A'} + m_{z\,A''} = 0$$

$$m_{z\,A'} = -m_{z\,A''}$$

$$\tau(y) = \frac{T_y \cdot m_{z\,A'}(y)}{b \cdot I_z}$$

EXPRESIÓN ANALÍTICA

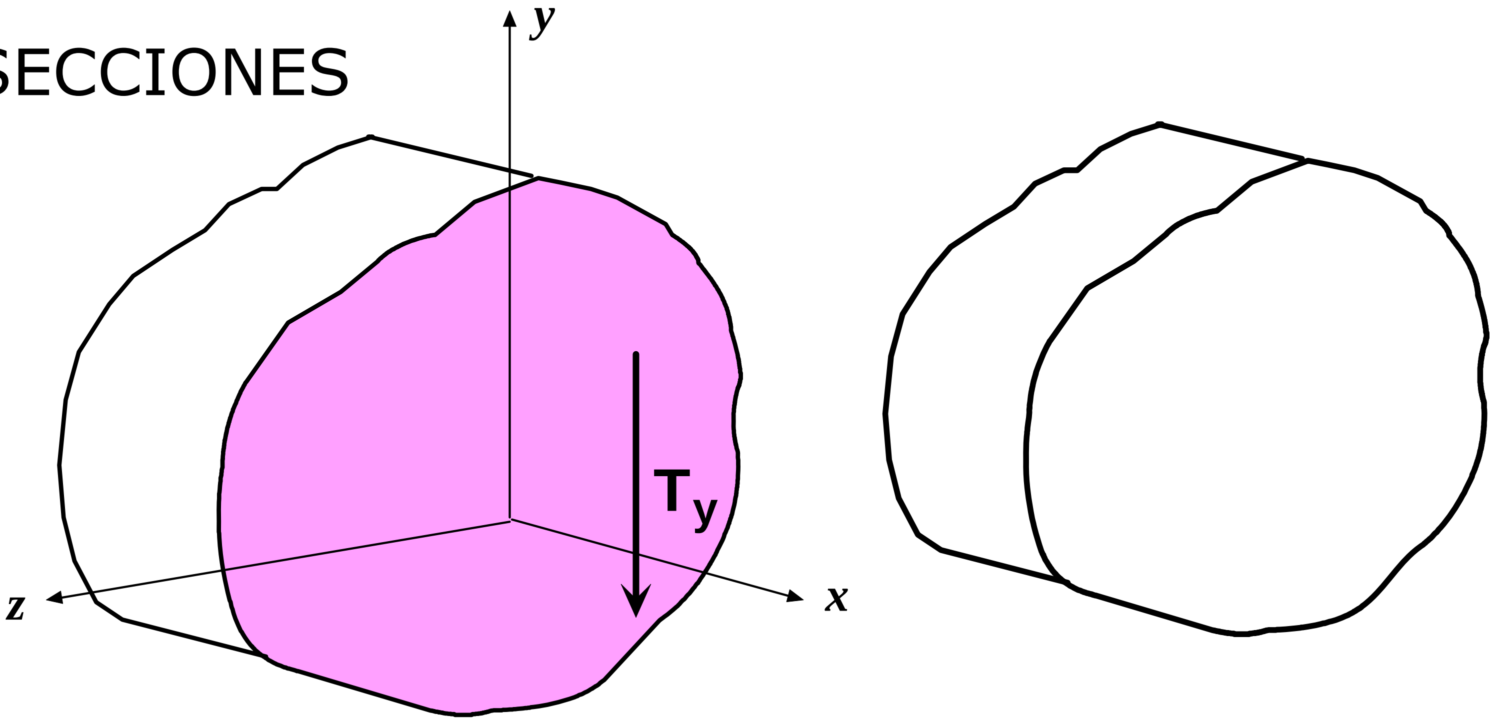


$$m_{z\,A'} = \iint_{A'} y\,dA = \int_{y}^{h/2} b \cdot y\,dy$$

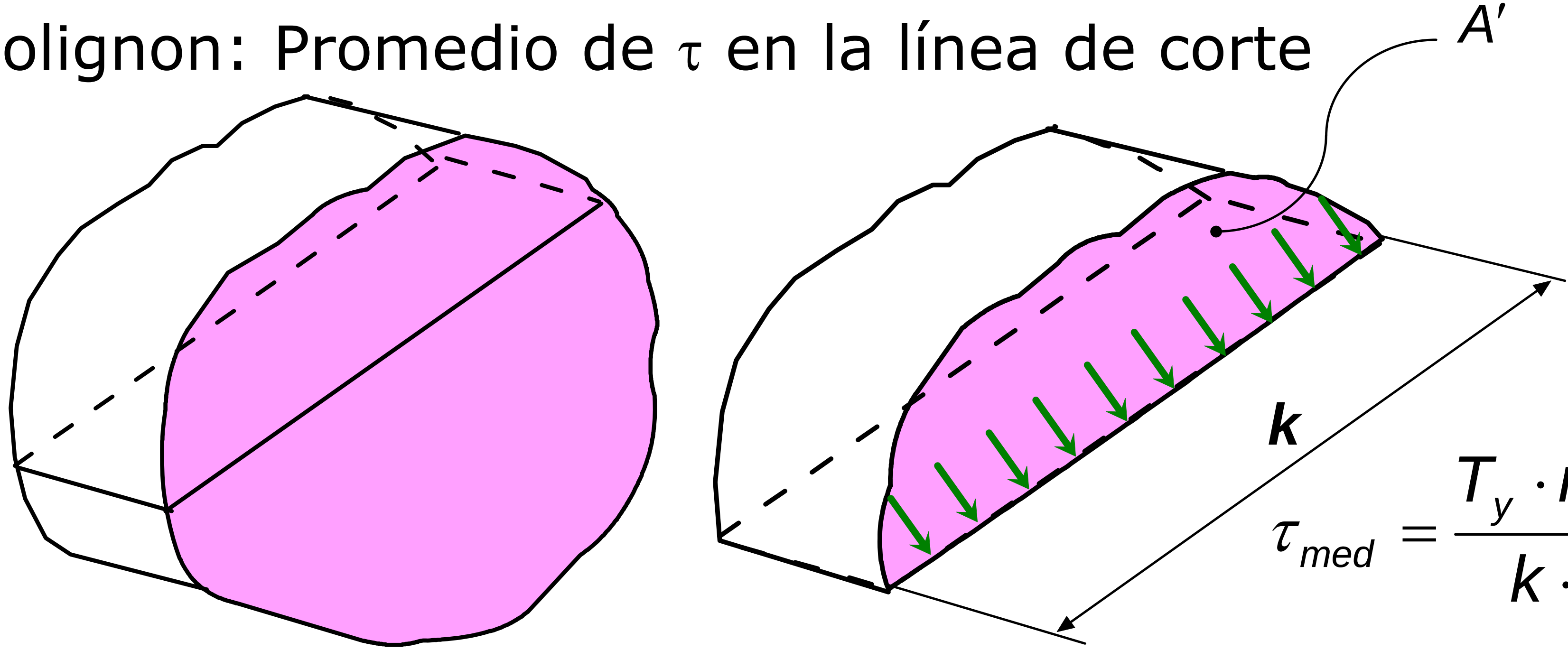
$$m_{z\,A'} =$$

$$\tau(y) = \frac{6 \cdot T_y}{bh^3}\left[\left(\frac{h}{2}\right)^2 - y^2\right]$$

OTRAS SECCIONES



Colignon: Promedio de τ en la línea de corte



$$\tau_{med} = \frac{T_y \cdot m_{z\,A'}}{k \cdot I_z}$$