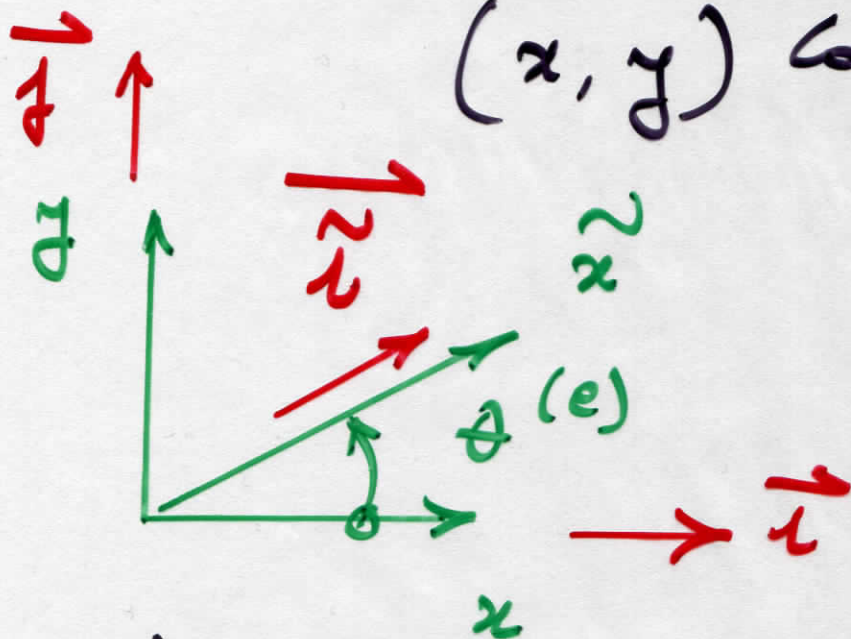


$$k^{(e)} = \frac{E^{(e)} A^{(e)}}{L^{(e)}}$$

axial stiffness
of bar elem "e"

$e = 1, 2$

$l^{(e)}, m^{(e)}$ = director cosines of x_2 axis (goes from $\boxed{1}$ to $\boxed{2}$) wrt global (x, y) coord.



$$l^{(e)} = \hat{x}_2 \cdot \hat{x}_1 = \cos \theta^{(e)}$$

$$m^{(e)} = \hat{x}_2 \cdot \hat{y} = \cos\left(\frac{\pi}{2} - \theta^{(e)}\right)$$

$$\hat{x}_2 = \cos \theta^{(e)} \hat{x} + \sin \theta^{(e)} \hat{y}$$