

Hooke's law

$$\delta = \frac{l}{AE} P$$

$$A = \pi d^2$$

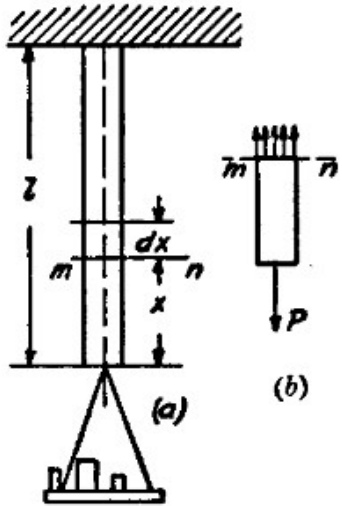


FIG. 1.

δ : total elongation of the bar
 P : force producing extension of the bar
 l : length of the bar
 A : cross sectional area of the bar
 E : elastic modulus
 d : radius

Elastic coeff: $\frac{E\pi d^2}{l}$

Pure bending

$$\frac{1}{r} = \frac{M}{EI_z}$$

$\frac{1}{r}$: curvature
 $I_z = \frac{\pi}{2} d^4$

$$P_{cr} = \frac{\pi^2 EI_z}{l^2}$$

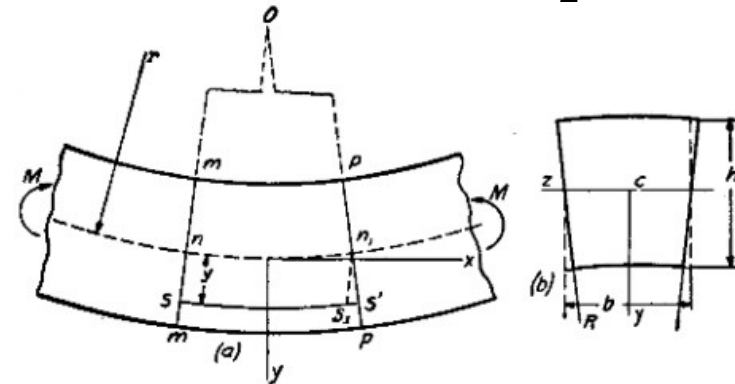


FIG. 77.

Bending coeff: $\frac{E\pi d^4}{2}$