Kap 11 Likevekt og elastisitet

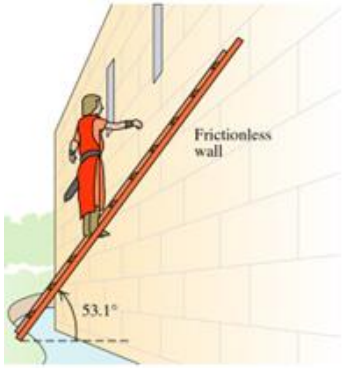
Betingelse for likevekt

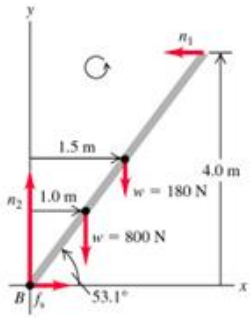
$$\sum \vec{F} = \vec{0}$$

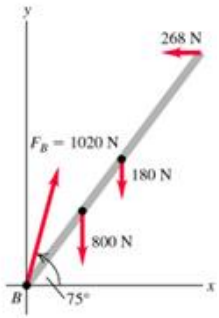
Summen av alle ytre krefter er lik null

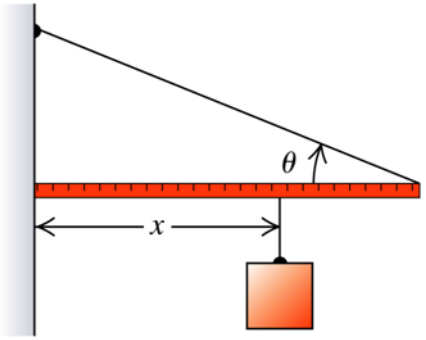
$$\sum \vec{\tau} = \vec{0}$$

Summen av alle ytre kraftmomenter om en vilkårlig akse er lik null









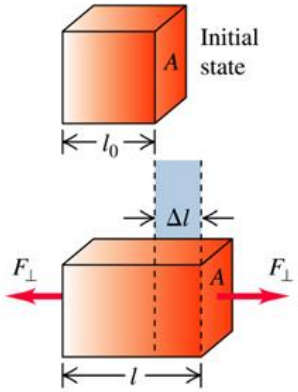
Kap 11 Likevekt og elastisitet

Hookes lov:
Den ytre kraften (Stress) på et system
er proporsjonal med deformasjonen (Strain) av systemet.
Proporsjonalitets-konstanten kalles elastisitetsmodulen.

$$\frac{Stress}{Strain} = Elastic\ \text{mod}\ ulus$$

Strekk-stress og strekk-strain:
Elastisitetsmodulen kalles for Youngs modulus.

$$Y = \frac{Tensile\ stress}{Tensile\ strain} = \frac{\frac{F_\perp}{A}}{\frac{\Delta l}{l_0}} = \frac{F_\perp}{A}\frac{l_0}{\Delta l}$$

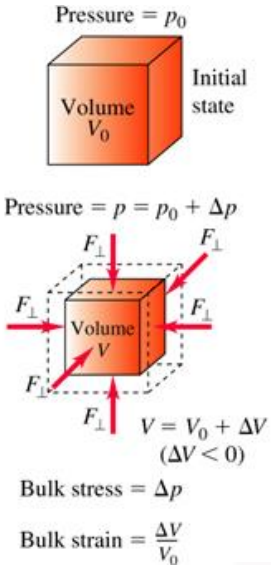


$$\text{Tensile stress} = \frac{F_\perp}{A}$$

$$\text{Tensile strain} = \frac{\Delta l}{l_0}$$

Bulk-stress og bulk-strain:
Elastisitetsmodulen kalles for Bulke modulus.

$$B = \frac{Bulk\ stress}{Bulk\ strain} = -\frac{\Delta p}{\frac{\Delta V}{V_0}}$$

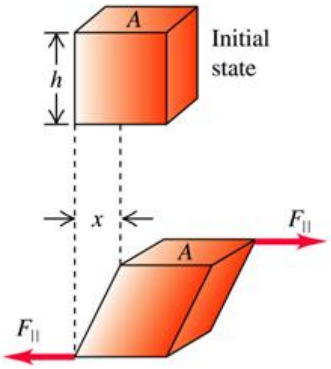


$$\text{Bulk stress} = \Delta p$$

$$\text{Bulk strain} = \frac{\Delta V}{V_0}$$

Share-stress og share-strain:
Elastisitetsmodulen kalles for Share modulus.

$$S = \frac{Share\ stress}{Share\ strain} = \frac{\frac{F_\perp}{A}}{\frac{x}{h}} = \frac{F_\perp}{A}\frac{h}{x}$$



$$\text{Shear stress} = \frac{F_{||}}{A}$$

$$\text{Shear strain} = \frac{x}{h}$$