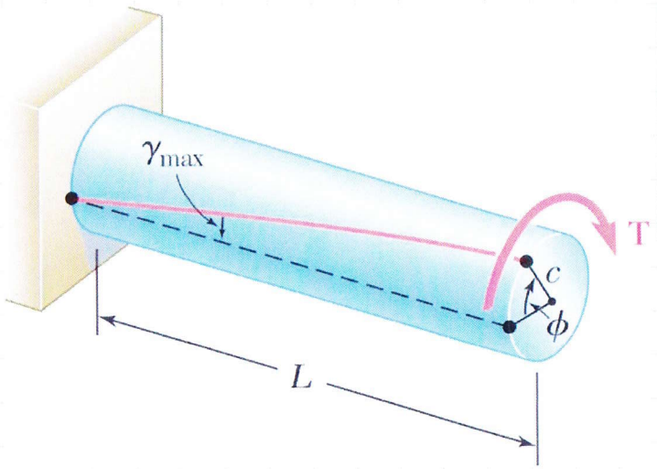
CVEN 305-301
Mechanics of Solids

Topic Angle of Twist

Date 6/18/15

Angle of Twist



$$\tau_{max} = \gamma_{max} G$$

$$\gamma_{max} = \frac{\tau_{max}}{G}$$

$$\tau_{max} = \frac{Tc}{J}$$

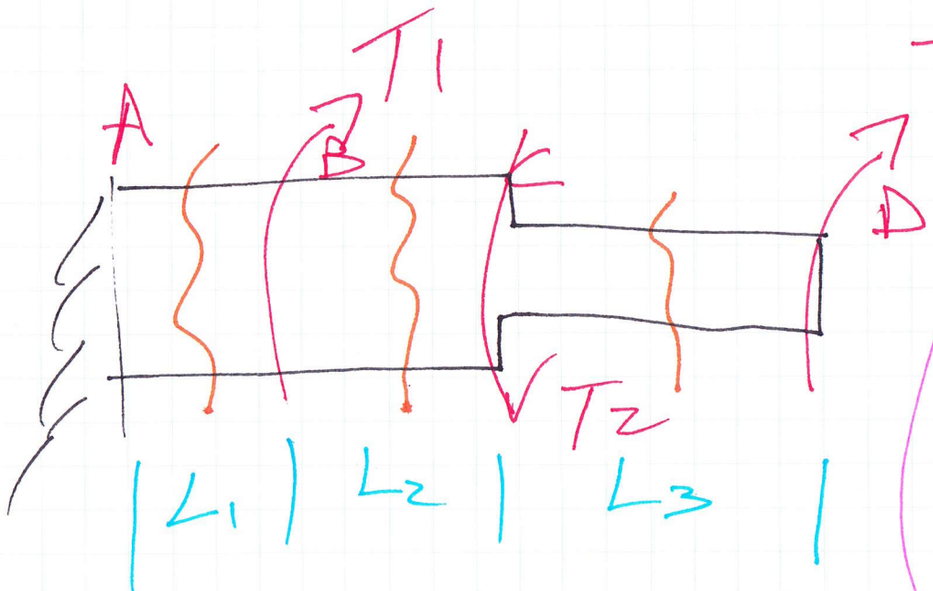
$$\gamma_{max} = \frac{Tc}{JG}$$

$$\gamma_{max} = \frac{c\phi}{L}$$

$$\frac{c\phi}{L} = \frac{Tc}{JG}$$

$$\phi = \frac{TL}{JG}$$

ϕ = Angle of twist; T = Applied Torque; L = Length; G = shearing modulus; J = Polar Moment of Inertia



$$\phi_{Total} = \sum_{i=1}^{n} \frac{T_i L_i}{J_i G_i}$$

Internal Torque in the section

Length of the segment

$$\phi = \int_0^L \frac{T(x)}{J(x)G(x)}\,dx$$