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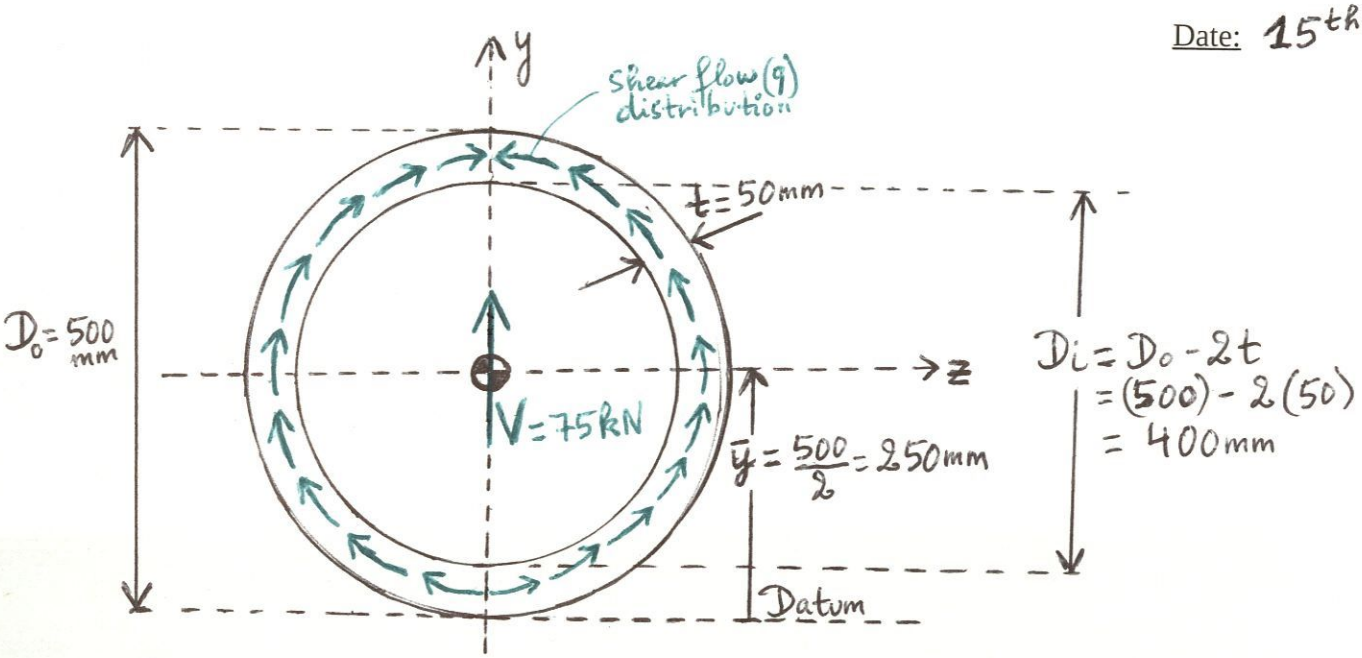
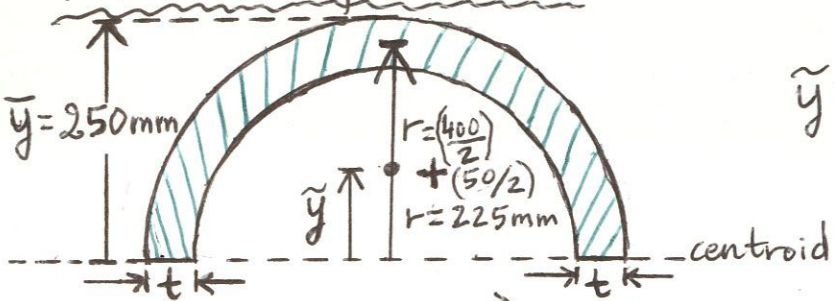
Date: 15th February 2019



$$I=\left[\frac{\pi}{64}(D_o)^4\right]-\left[\frac{\pi}{64}(D_i)^4\right]=\left[\frac{\pi}{64}(0.5m)^4\right]-\left[\frac{\pi}{64}(0.4m)^4\right]=0.02898\,m^4$$

First Moment of Area, Q



$$\tilde{y}=\frac{2r}{\pi}=\frac{2(0.225m)}{\pi}=0.1432\,m$$

$$A=\frac{\left(\frac{\pi}{4}\left[(D_o)^2-(D_i)^2\right]\right)}{2}=\frac{\left(\frac{\pi}{4}\left[(0.5m)^2-(0.4m)^2\right]\right)}{2}=0.0353\,m^2$$

$$Q=A\tilde{y}=(0.0353m^2)(0.1432m)=5.0611*10^{-3}\,m^3$$

$$t=(50mm)+(50mm)=100mm=0.1m$$

$$\tau_{MAX}=\frac{(V_{MAX})(Q)}{(I)(t)}=\frac{(75\,kN)(5.0611*10^{-3}m^3)}{(0.02898m^4)(0.1\ m)}=131\ kPa$$