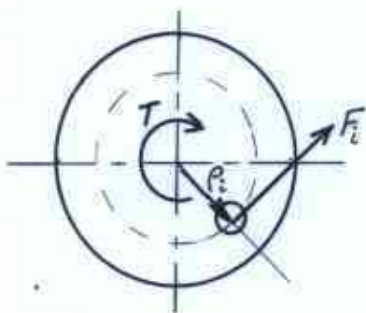


How many 20mm Bolts
are required to transmit
the torque of 10kNm
Shear not to exceed 70MPa

Centre of rotation & Centroid of Joint ~~is~~ ^{are} @ circle centre



$$F_i = \tau_i A_i$$

$$p_i = 70\text{mm}$$

$$\sum M_o = \sum p_i F_i = 10000$$

$$\sum p_i F_i = \sum p_i \tau_i A_i$$

$$= n(p_i \tau_i A_i) = 1 \times 10^4$$

$$A_i = \frac{\pi}{4} (20 \times 10^{-3})^2 = 314.16 \times 10^{-6} \text{ m}^2$$

$$\therefore n = \frac{1 \times 10^4}{(70 \times 10^{-3}) (314.16 \times 10^{-6}) (70 \times 10^6)}$$

↙ max shear stress allowed

$n = 6.5$

$\Rightarrow 7$ bolts.

cannot have a half bolt
& 6-bolts leads to stresses
greater than allowable