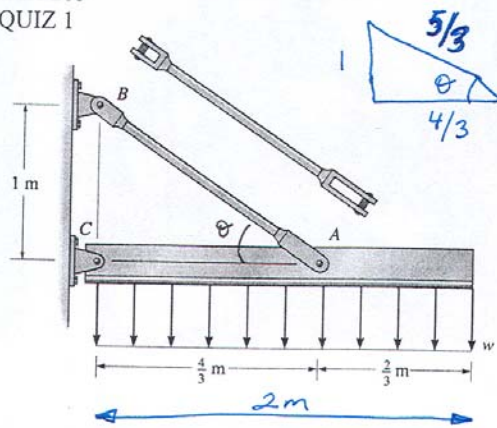Adı ve Soyadı:
Numarası:

Problem : 1-102

Determine the intensity w of the maximum distributed load that can be supported by the hanger assembly so that an allowable shear stres of $\tau_{allow} = 100\,MPa$ is not exceeded in the 12-mm-diameter bolts at A and B, and an allowable tensile stres of $\sigma_{allow} = 150\,MPa$ is not exceeded in the 15-mm-diameter rod AB.
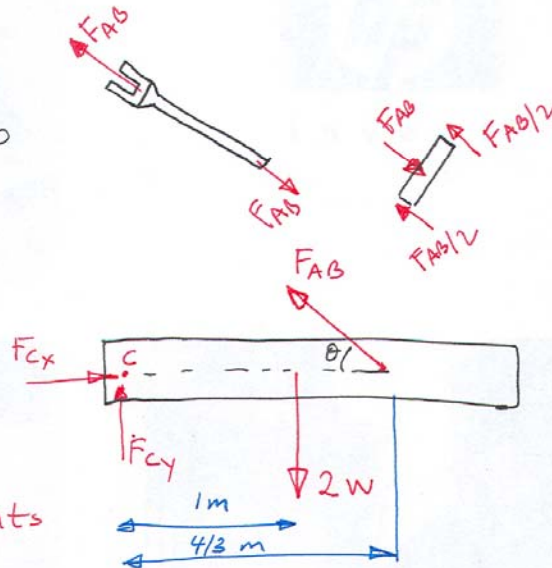
$\uparrow \Sigma M_C = 0$

$2w \cdot 1 - F_{AB} \sin\theta \cdot \dfrac{4}{3} = 0$

$\sin\theta = \dfrac{1}{\sqrt{1^2 + \left(\frac{4}{3}\right)^2}} = \dfrac{3}{5}$

$F_{AB} = \dfrac{2w}{\dfrac{3}{5} \cdot \dfrac{4}{3}} = \dfrac{10}{4}w$

$\boxed{F_{AB} = \dfrac{10}{4}w}$ 4 points

*

** $\sigma_{allow} = 150 * 10^6 \dfrac{N}{m^2} = \dfrac{F_{AB}}{\dfrac{\pi}{4}(d_{AB})^2} = \dfrac{\dfrac{10}{4}w}{\dfrac{\pi}{4}(0.015)^2} \Rightarrow \boxed{W = 10.6\,kN/m}$ 3 points

* $\tau_{allow} = 100 * 10^6 \dfrac{N}{m^2} = \dfrac{F_{AB}/2}{\dfrac{\pi}{4}(d_{bolt})^2} = \dfrac{\dfrac{5}{4}w}{\dfrac{\pi}{4}(0.012)^2} \Rightarrow \boxed{W = 9.05\,\dfrac{kN}{m}}$ 3 points

$\boxed{W = 9.05\ kN}$ Ans.