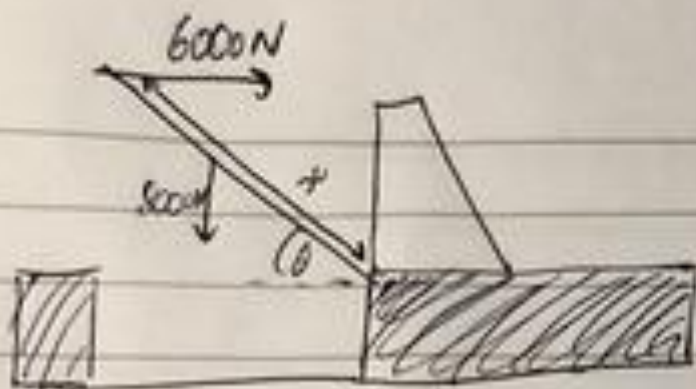


- 6 The diagram shows a drawbridge inclined at an angle θ to the horizontal, where $0 < \theta < 90^\circ$. The drawbridge is modelled as a uniform rod of weight 8000 N. A horizontal force of 6000 N is applied at the top of the drawbridge. Given that the drawbridge is rising, prove that $\tan \theta > \frac{2}{3}$.

Hint

The drawbridge is modelled as a uniform rod so its weight acts at its midpoint.

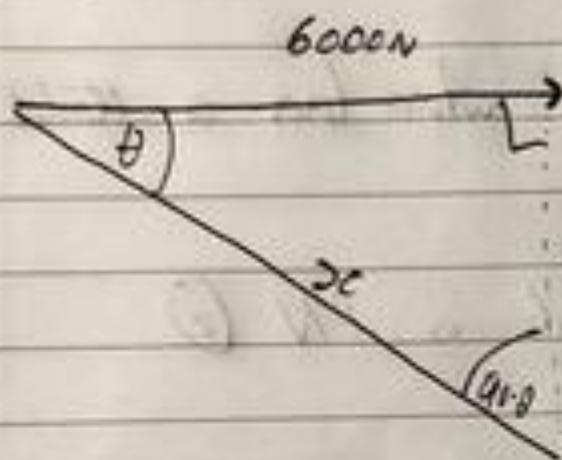
6)



As double bridge is fixing, Σ clockwise moments $>$

clockwise:

Anti-c



$$\text{Moment} = 6000 \times x \sin \theta$$

$$\text{Moment} = 8000 \times x \cos \theta$$

$$6000 \times \sin \theta > 8000 \times \cos \theta$$

$$\frac{6}{8} \tan \theta > \frac{4}{6}$$

$$\tan \theta > \frac{2}{3}$$

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