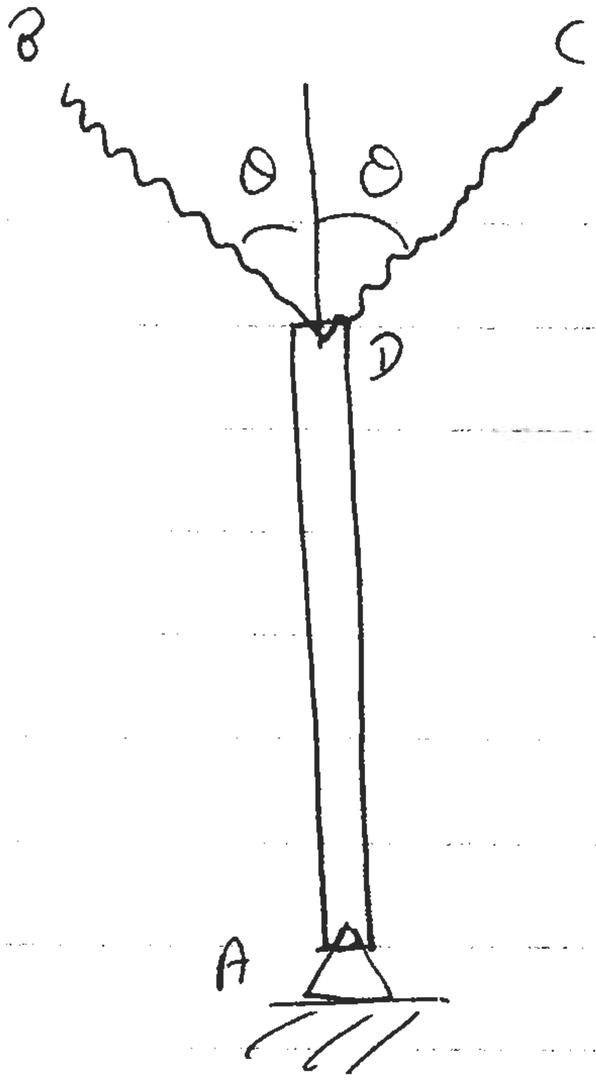
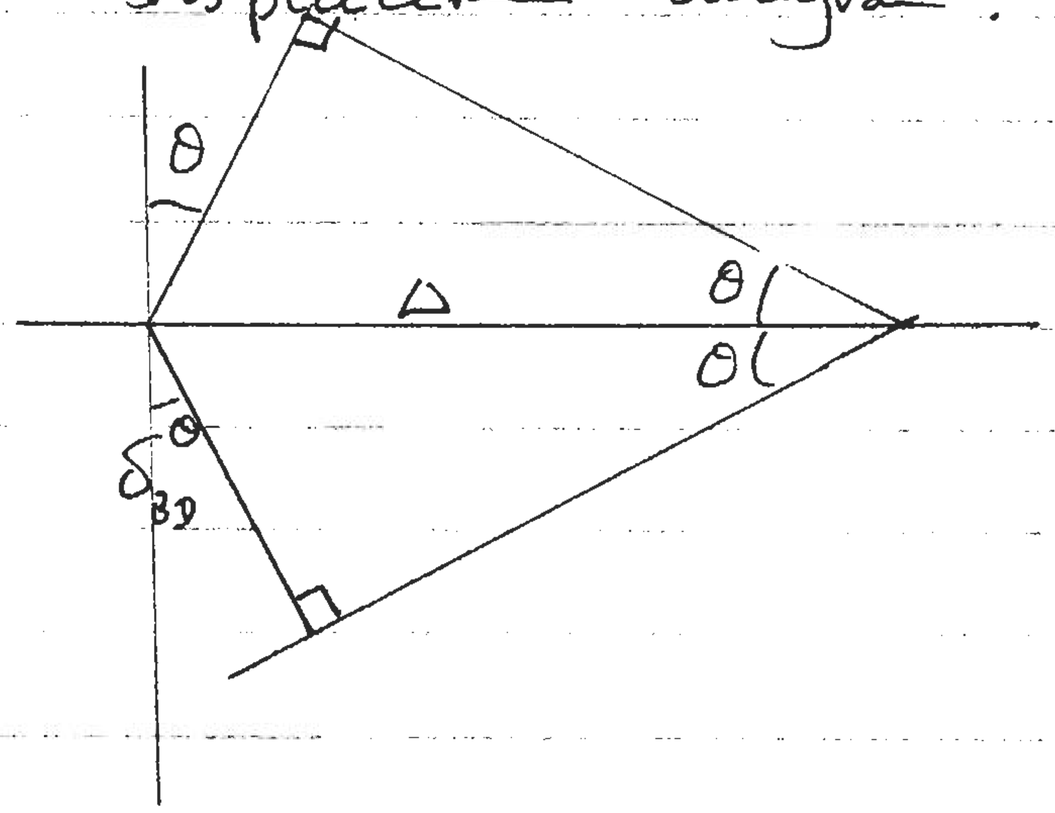
M12



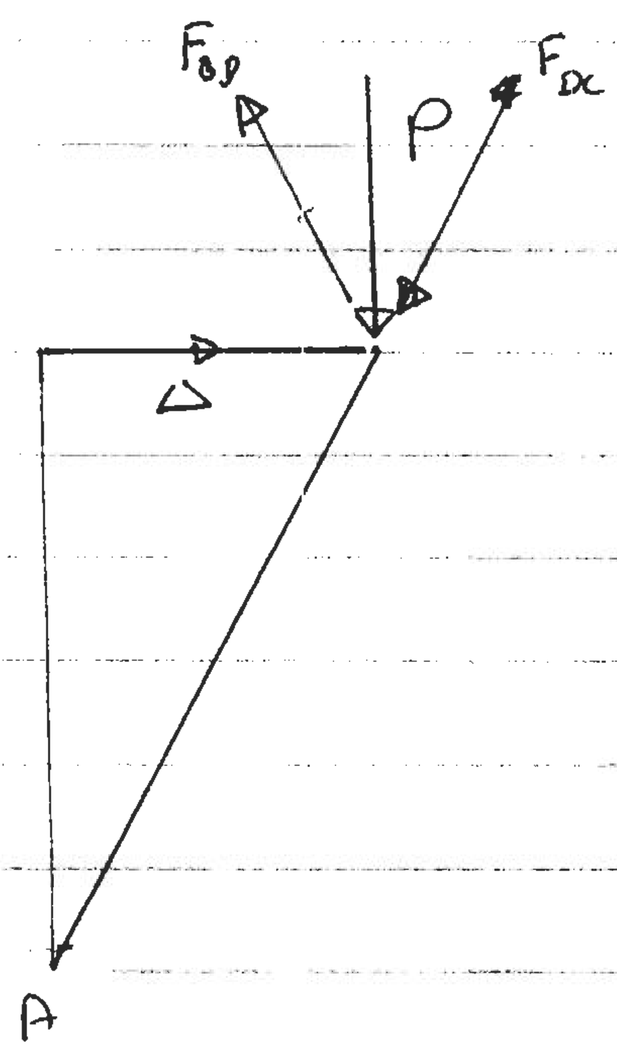
Displace D horizontally by Δ
BD & DC extend by δ and rotate

Displacement diagram.



∴ compatibility: $\Delta \sin\theta = \delta_{BD} = \delta_{DC} = \delta$

BD extending, DC shortening ∴ FBD



$F_{BD} = K\,\delta_{BD} = K\delta$

$F_{DC} = K\,\delta_{DC} = K\delta$

∴ ~~Vertical comp:~~ Net vertical force
$= 0$

Horizontal component $= 2F_{BD} = 2K\delta$

$= 2K\Delta\sin\theta$ ⇐

∴ equilibrium of moments about A

$$\Rightarrow \left(\underset{A}{M = 0}\right) : +2K\not{\Delta}\sin\theta . L - P\not{\Delta} = 0$$

$$P = 2K\sin\theta L$$

If $P > 2K\sin\theta L$ then collapse occurs ⟸