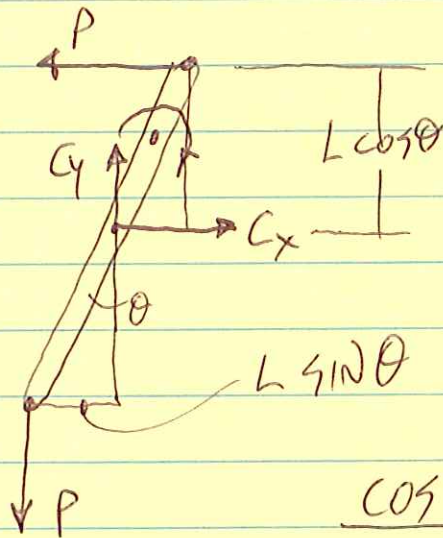


①

PROB. 4.52

DERIVE AN EQUATION FOR EQUILIBRIUM, THEN

FIND θ FOR $M = 150 \text{ N}\cdot\text{m}$, $P = 200 \text{ N}$, $L = 600 \text{ mm}$.FBD

$$\sum F_x = 0: C_x - P = 0 \Rightarrow C_x = P$$

$$\sum F_y = 0: C_y - P = 0 \Rightarrow C_y = P$$

$$\sum M_c = 0 \text{ (+)}:$$

$$P(L \cos \theta) + P(L \sin \theta) - M = 0$$

$$\cos \theta + \sin \theta = \frac{M}{PL}$$

$$M = \frac{(150 \text{ N}\cdot\text{m})}{(200 \text{ N})(600 \text{ mm})} \cdot \left(\frac{1000 \text{ mm}}{1 \text{ m}} \right) = 1.25$$

PLOT $\cos \theta + \sin \theta = 1.25$ USING EXCEL.

$$\theta = 17^\circ \text{ AND } 73^\circ$$

Prob. 4.52

