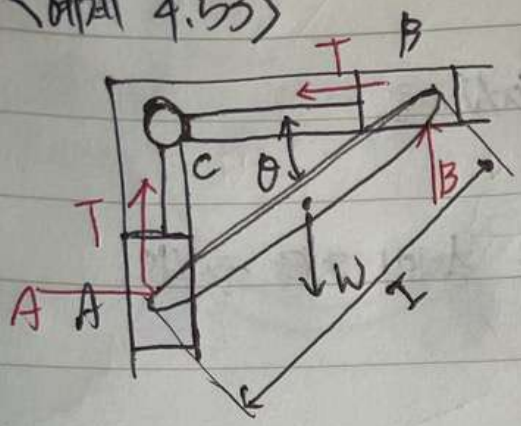
〈예제 4.53〉



(a) W, θ의 함수에서 장력을 구하시오.

(b) 장력 = 3W 일 때 θ를 구하시오.

(a) [redacted] $+\circlearrowleft \sum M_C = 0$: $T(l\sin\theta) + W\left[\frac{1}{2}\cdot\cos\theta\right] - T(l\cos\theta) = 0$

$$T = \frac{W\cos\theta}{2(\cos\theta - \sin\theta)} = \frac{W}{2}\left(\frac{1}{1-\tan\theta}\right)$$

(b) $T = 3W$,

$$3W = \frac{W}{2}\left(\frac{1}{1-\tan\theta}\right)$$

$$1 - \tan\theta = \frac{1}{6} \qquad \tan\theta = \frac{5}{6}$$

$$\therefore \theta = \tan^{-1}\left(\frac{5}{6}\right) = 39.806^\circ \fallingdotseq 39.8^\circ$$