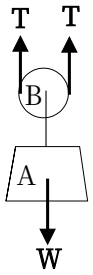
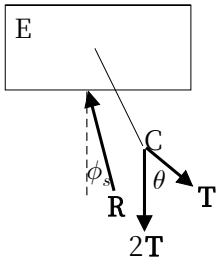
{8.3~8.4절}

8.10 $W$ = 20 N, $\mu_s$ = 0.35




블럭 A와 풀리 B에서

$\uparrow \Sigma F_y = 0$ ; $2T - W = 0$

$\Rightarrow \quad T = \frac{1}{2}W = \frac{1}{2}(20\ \text{N}) = 10\ \text{N}$

블록 E와 풀리 C에서

$\phi_s = \tan^{-1}\mu_s = \tan^{-1}(0.35) = 19.29°$

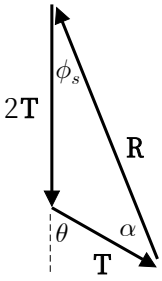
$\frac{2T}{\sin\alpha} = \frac{T}{\sin\phi_s}$

$\Rightarrow \quad \sin\alpha = 2\sin\phi_s = 2\sin 19.29° = 0.6607$

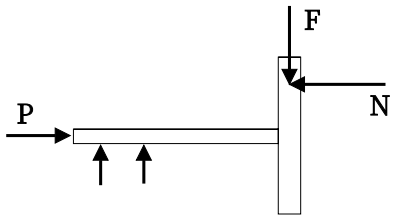
$\alpha = \sin^{-1}(0.6607) = 41.35°$

$\theta = \alpha + \phi_s = 41.35° + 19.29° = 60.64°$

$\Rightarrow \quad \theta = 60.6°$




8.40 $P$ = 8 N, $\mu_s$ = 0.25, $r$ = 0.076 m, $\theta$ = 65°



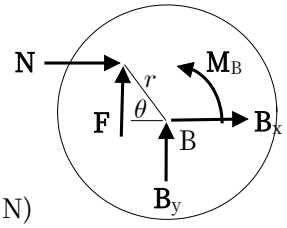

yoke에서

$\rightarrow \Sigma F_x = 0$ ; $P - N = 0$

$\Rightarrow \quad N = P = 8\ \text{N}$

$F = \mu_s N = (0.25)(8\ \text{N}) = 2\ \text{N}$

(a) 최대 $M_B$일 때 마찰력 **F**의 방향은 그림에 있는 방향




wheel에서

$\circlearrowleft \Sigma M_B = 0$ ; $M_B - (r\sin\theta)N - (r\cos\theta)F = 0$

$\Rightarrow M_B = (r\sin\theta)N + (r\cos\theta)F$

$= (0.076\ \text{m})\sin 65°\ (8\ \text{N}) + (0.076\ \text{m})\cos 65°\ (2\ \text{N})$

$= 0.6153\ \text{N·m}$

$(\mathbf{M}_B)_{max} = 0.615\ \text{N·m}\circlearrowleft$

(b) 최소 $M_B$일 때 마찰력 **F**의 방향은 그림에서와 반대 방향

wheel에서

$\circlearrowleft \Sigma M_B = 0$ ; $M_B - (r\sin\theta)N + (r\cos\theta)F = 0$

$\Rightarrow M_B = (r\sin\theta)N - (r\cos\theta)F$

$= (0.076\ \text{m})\sin 65°\ (8\ \text{N}) - (0.076\ \text{m})\cos 65°\ (2\ \text{N})$

$= 0.4868\ \text{N·m}$

$(\mathbf{M}_B)_{min} = 0.487\ \text{N·m}\circlearrowleft$