

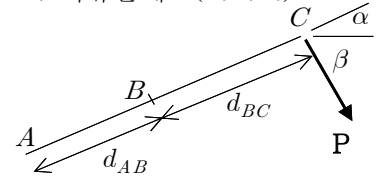
[3.3절]

3.82  $P = 250 \text{ N}$ ,  $\alpha = 30^\circ$ ,  $\beta = 60^\circ$ ,  $d_{AB} = 0.2 \text{ m}$ ,  $d_{BC} = 0.3 \text{ m}$

S;  $\mathbf{P} = 250 \text{ N} \searrow 60^\circ$

2차원 등가 힘-우력 계

M; 자유물체도(F.B.D.)



A; (a)  $\Sigma \mathbf{F} = \mathbf{F}_B = \mathbf{P}$

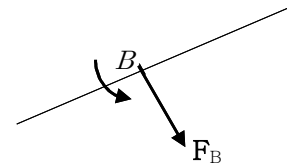
$$\Rightarrow \mathbf{F}_B = 250 \text{ N} \searrow 60^\circ$$

$\curvearrowright \Sigma M_B = M_B$

$$= -d_{BC} P$$

$$= -(0.3 \text{ m})(250 \text{ N}) = -75.0 \text{ N} \cdot \text{m}$$

$$\Rightarrow \mathbf{M}_B = 75.0 \text{ N} \cdot \text{m} \curvearrowleft$$



(b)  $\Sigma \mathbf{F} = \mathbf{F}_A + \mathbf{F}_B = \mathbf{P}$

$$\Sigma F_x; F_A \cos \phi + F_B \cos \phi = 0$$

$$\Rightarrow (F_A + F_B) \cos \phi = 0$$

$$\Rightarrow F_A + F_B = 0, \text{ 또는 } \cos \phi = 0$$

$$\Sigma F_y; F_A \sin \phi + F_B \sin \phi = P$$

$$\Rightarrow (F_A + F_B) \sin \phi = P$$

$$\Rightarrow F_A + F_B \neq 0, \cos \phi = 0 \Rightarrow \phi = 90^\circ$$

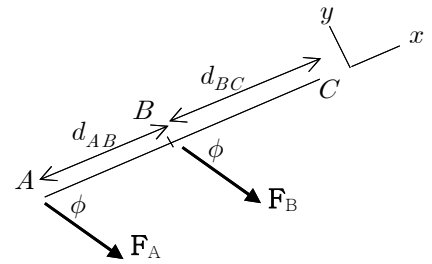
$$\Rightarrow F_A + F_B = P \quad \dots \textcircled{1}$$

$$\Sigma M_B; d_{AB} F_A = -d_{BC} P \quad \dots \textcircled{2}$$

$$\textcircled{2} \Rightarrow F_A = -\frac{d_{BC}}{d_{AB}} P = -\frac{300 \text{ mm}}{200 \text{ mm}} (250 \text{ N}) = -375 \text{ N}$$

$$\textcircled{1} \Rightarrow F_B = P - F_A = (250 \text{ N}) - (-375 \text{ N}) = 625 \text{ N}$$

$$\Rightarrow \mathbf{F}_A = 375 \text{ N} \swarrow 60.0^\circ, \mathbf{F}_B = 625 \text{ N} \searrow 60.0^\circ$$



R(과정의 타당성) ; (가령,  $\curvearrowright \Sigma M_B$  대신  $\curvearrowright \Sigma M_C$  을 비교하면? )

T(결과의 의미) ; (가령,  $\curvearrowleft \Sigma M_A$  는? )