

[3.3절]

3.86 $P = 360 \text{ N}$, $\alpha = 30^\circ$, $\beta = 40^\circ$, $d_{AB} = 0.4 \text{ m}$, $d_{BC} = 0.35 \text{ m}$

S; $\mathbf{F}_A = ?$, $\mathbf{F}_C = ? \Rightarrow$ 2차원 등가 힘-우력 계

M; 자유물체도(F.B.D.)

A; $\mathbf{F}_A \parallel \mathbf{F}_C$, $\Sigma \mathbf{F} = \mathbf{F}_A + \mathbf{F}_C = \mathbf{P}$

$\Rightarrow \mathbf{F}_A$ 의 방향 = \mathbf{F}_C 의 방향 = \mathbf{P} 의 방향 = $\nabla 50.0^\circ$

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

$$\theta = \beta - \alpha = 40^\circ - 30^\circ = 10^\circ$$

$$\uparrow \Sigma M_B = 0$$

$$= d_{AB} F_A \cos \theta - d_{BC} F_C \cos \theta$$

$$= (d_{AB} F_A - d_{BC} F_C) \cos \theta$$

$$\Rightarrow d_{AB} F_A - d_{BC} F_C = 0 \quad \dots \textcircled{2}$$

$$d_{BC} \times \textcircled{1} + \textcircled{2}$$

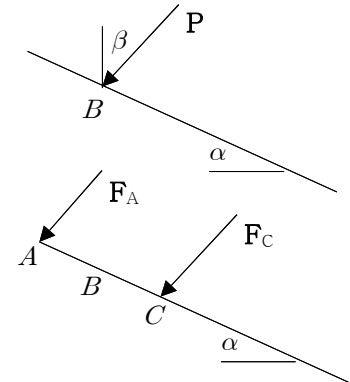
$$\Rightarrow d_{BC} F_A + d_{AB} F_A = d_{BC} P$$

$$\Rightarrow F_A = \frac{d_{BC}}{d_{BC} + d_{AB}} P = \frac{0.35}{0.35 + 0.4} (360 \text{ N}) = 168.0 \text{ N}$$

$$\textcircled{1} \Rightarrow F_C = P - F_A = P - \frac{d_{BC}}{d_{BC} + d_{AB}} P$$

$$= \frac{d_{AB}}{d_{BC} + d_{AB}} P = \frac{0.4}{0.35 + 0.4} (360 \text{ N}) = 192.0 \text{ N}$$

$$\Rightarrow \mathbf{F}_A = 168.0 \text{ N } \nabla 50.0^\circ, \quad \mathbf{F}_C = 192.0 \text{ N } \nabla 50.0^\circ$$



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

T(결과의 의미) ; (가령, $F_C > F_A$ 의 의미)