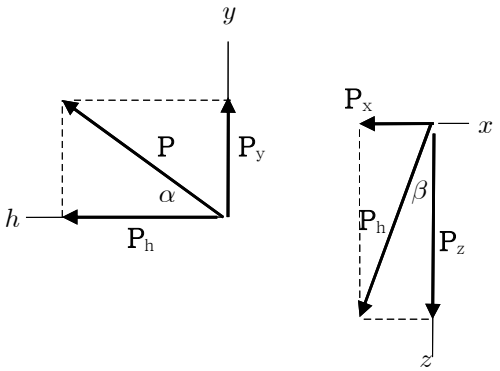
[2.4절]

2.72 P = 450 N, α = 35°, β = 40°

S; known P, α, β,
unknown $\mathbf{F}_x$, $\mathbf{F}_y$, $\mathbf{F}_z$, θ_x, θ_y, θ_z
⇒ 공간에서 힘의 직각성분 (각도 이용), 방향여현

M;



A;

(a) $P_y = P \sin\alpha$ = (450 N) sin35° = 258.1 N

$P_h = P \cos\alpha$

$P_x = -P_h \sin\beta = -P \cos\alpha \sin\beta$

= -(450 N) cos35° sin40° = -236.9 N

$P_z = P_h \cos\beta = P \cos\alpha \cos\beta$

= (450 N) cos35° cos40° = 282.4 N

⇒ $\mathbf{P}$ = (-237 N) $\mathbf{i}$ + (258 N) $\mathbf{j}$ + (282 N) $\mathbf{k}$

(b) $\cos\theta_x = \dfrac{P_x}{P} = \dfrac{-236.9\text{ N}}{450\text{ N}} = -0.5264$ ⇒ $\theta_x = \cos^{-1}(-0.5264) = 121.7°$

$\cos\theta_y = \dfrac{P_y}{P} = \dfrac{258.1\text{ N}}{450\text{ N}} = 0.5736$ ⇒ $\theta_x = \cos^{-1}(0.5736) = 55.0°$

$\cos\theta_z = \dfrac{P_z}{P} = \dfrac{282.4\text{ N}}{450\text{ N}} = 0.6276$ ⇒ $\theta_z = \cos^{-1}(0.6276) = 51.1°$

R; 과정의 타당성 (가령,)

T; 결과 검토 (가령, 힘 성분의 부호와 방향 각도의 범위)