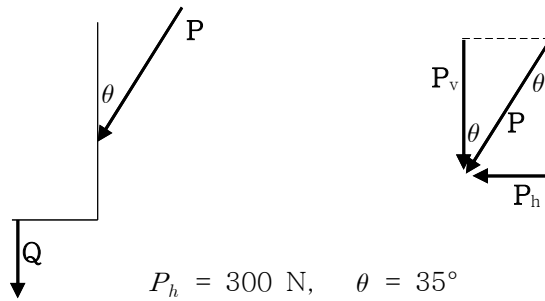


<2.7~8절>

2.25 [힘의 직각성분]

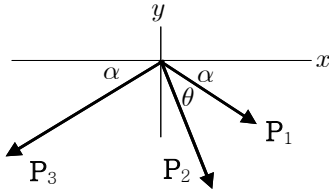


$$P_h = 300 \text{ N}, \quad \theta = 35^\circ$$

$$(a) \quad P_h = P \sin\theta \quad \Rightarrow \quad P = \frac{P_h}{\sin\theta} = \frac{300 \text{ N}}{\sin 35^\circ} = 523.0 \text{ N} \quad \Rightarrow \quad P = 523 \text{ N}$$

$$(b) \quad \frac{P_h}{P_v} = \tan\theta \quad \Rightarrow \quad P_v = \frac{P_h}{\tan\theta} = \frac{300 \text{ N}}{\tan 35^\circ} = 428.4 \text{ N} \quad \Rightarrow \quad P_v = 428 \text{ N} \downarrow$$

2.39 [직각성분 합에 의한 힘의 합성]



$$P_1 = 100 \text{ N}, \quad P_2 = 150 \text{ N}, \quad P_3 = 200 \text{ N}$$

$$\theta = 30^\circ, \quad \mathbf{R} = R \downarrow \quad (\Rightarrow \quad R_x = 0)$$

$$\begin{aligned} (a) \quad R_x &= \Sigma F_x \\ &= P_1 \cos\alpha + P_2 \cos(\alpha + \theta) - P_3 \cos\alpha \\ &= P_2 (\cos\alpha \cos\theta - \sin\alpha \sin\theta) - (P_3 - P_1) \cos\alpha = 0 \\ \Rightarrow \quad (P_2 \cos\theta - P_3 + P_1) \cos\alpha &= (P_2 \sin\theta) \sin\alpha \\ \Rightarrow \quad \tan\alpha &= \frac{P_2 \cos\theta - P_3 + P_1}{P_2 \sin\theta} = \frac{(150 \text{ N}) \cos 30^\circ - (200 \text{ N}) + (100 \text{ N})}{(150 \text{ N}) \sin 30^\circ} = 0.3987 \\ \Rightarrow \quad \alpha &= \tan^{-1}(0.3987) = 21.74^\circ \quad \Rightarrow \quad \alpha = 21.7^\circ \end{aligned}$$

$$\begin{aligned} (b) \quad R_y &= \Sigma F_y \\ &= -P_1 \sin\alpha - P_2 \sin(\alpha + \theta) - P_3 \sin\alpha \\ &= -(100 \text{ N}) \sin 21.7^\circ - (150 \text{ N}) \sin(21.7^\circ + 30^\circ) - (200 \text{ N}) \sin 21.7^\circ \\ &= -228.6 \text{ N} \\ \mathbf{R} &= 229 \text{ N} \downarrow \quad \Rightarrow \quad R = 229 \text{ N} \end{aligned}$$