

[4.6~4.7절]

4.61 [세 힘이 작용하는 강체의 평형, 세 힘의 작용선이 한 점에서 만남]

$$P = 320 \text{ N}, \quad a = 150 \text{ mm},$$

$$b = 240 \text{ mm}, \quad h = 80 \text{ mm}$$

$$\tan\theta = \frac{h}{a} = \frac{80 \text{ mm}}{150 \text{ mm}} = 0.5333$$

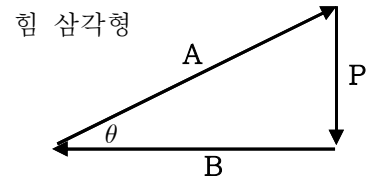
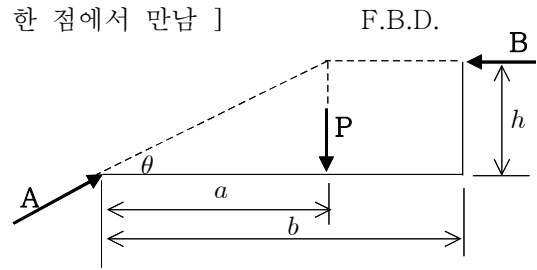
$$\theta = \tan^{-1}(0.5333) = 28.07^\circ$$

$$A = \frac{P}{\sin\theta} = \frac{320 \text{ N}}{\sin 28.07^\circ} = 680 \text{ N}$$

$$\Rightarrow \mathbf{A} = 680 \text{ N} \angle 28.1^\circ$$

$$B = \frac{P}{\tan\theta} = \frac{320 \text{ N}}{0.5333} = 600.0 \text{ N}$$

$$\Rightarrow \mathbf{B} = 600 \text{ N} \leftarrow$$



4.67 [세 힘이 작용하는 강체의 평형, 세 힘의 작용선이 한 점에서 만남]

$$\alpha = 45^\circ, \quad P = 80 \text{ N}$$

$$\tan\theta = \frac{160 + 60 \text{ mm}}{250 \text{ mm}} = 0.880$$

$$\Rightarrow \theta = \tan^{-1}(0.880) = 41.348^\circ$$

$$\gamma = 90^\circ + \theta = 90^\circ + 41.35^\circ = 131.35^\circ$$

$$\beta = 180^\circ - \gamma - \alpha$$

$$= 180^\circ - 131.35^\circ - 45^\circ = 3.65^\circ$$

$$\frac{R}{\sin\alpha} = \frac{P}{\sin\beta}$$

$$\Rightarrow R = P \frac{\sin\alpha}{\sin\beta} = (80 \text{ N}) \frac{\sin 45^\circ}{\sin 3.65^\circ}$$

$$= 888.58 \text{ N}$$

$$\Rightarrow \mathbf{R} = 889 \text{ N} \searrow 41.3^\circ$$

$$\frac{F}{\sin\gamma} = \frac{P}{\sin\beta}$$

$$\Rightarrow F = P \frac{\sin\gamma}{\sin\beta} = (80 \text{ N}) \frac{\sin 131.35^\circ}{\sin 3.65^\circ}$$

$$= 943.35 \text{ N}$$

$$\Rightarrow \mathbf{F} = 943 \text{ N} \angle 45.0^\circ$$

