

<4.6~4.7절>

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

$$T_{BA} = 200 \text{ N}$$

$$\tan\theta = \frac{(7 \text{ cm}) \sin 60^\circ}{15 \text{ cm}} = 0.4041$$

$$\Rightarrow \theta = \tan^{-1}(0.4041) = 22.0^\circ$$

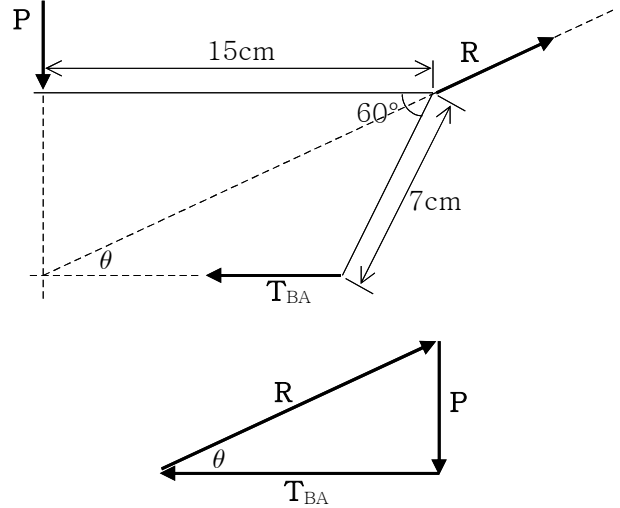
(a)  $P = T_{BA} \tan\theta$

$$= (200 \text{ N}) (0.4041) = 80.82 \text{ N}$$

$$\Rightarrow \mathbf{P} = 80.8 \text{ N } \downarrow$$

(b)  $R = \frac{T_{BA}}{\cos\theta} = \frac{200 \text{ N}}{\cos 22.0^\circ} = 215.7 \text{ N}$

$$\Rightarrow \mathbf{R} = 216 \text{ N } \nearrow 22.0^\circ$$



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

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

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

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

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

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

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

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

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

$$= 888.58 \text{ N}$$

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

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

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

$$= 943.35 \text{ N}$$

$$\Rightarrow \mathbf{F} = 948 \text{ N } \swarrow 45.0^\circ$$

