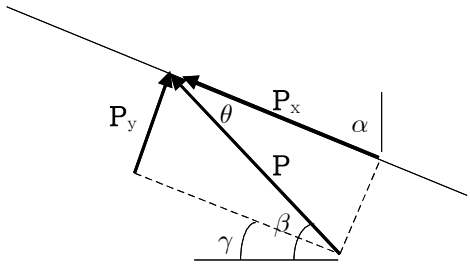
[2.7~8절]

2.26 [힘의 직각성분]

P_y = 750 N

α = 60°, β = 50°



γ = 90° − α = 90° − 60° = 30°

θ = β − γ = 50° − 30° = 20°

(a) $P_y = P\sin\theta \quad \Rightarrow \quad P = \dfrac{P_y}{\sin\theta} = \dfrac{750\text{ N}}{\sin 20^\circ} = 2193\text{ N} \quad \Rightarrow \quad P = 2190\text{ N}$

(b) $\tan\theta = \dfrac{P_y}{P_x} \quad \Rightarrow \quad P_x = \dfrac{P_y}{\tan\theta} = \dfrac{750\text{ N}}{\tan 20^\circ} = 2061\text{ N}$

(또는 $P_x = P\cos\theta$ = (2193 N) cos20° = 2061 N) ⇒ P_x = 2060 N ⊼30°

2.40 [직각성분 합에 의한 힘의 합성]

합력이 수직방향 ⇒ $R_x = 0$

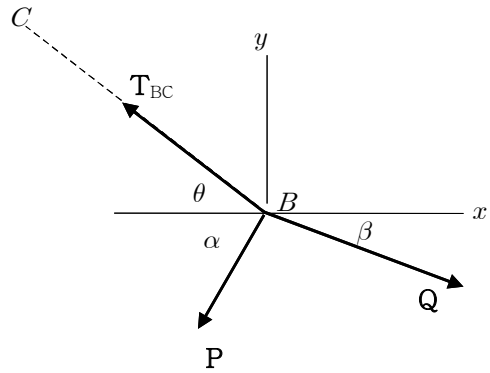
P = 500 N, Q = 780 N

$\cos\theta = \dfrac{840\text{ mm}}{1160\text{ mm}} = \dfrac{21}{29}$

$\sin\theta = \dfrac{800\text{ mm}}{1160\text{ mm}} = \dfrac{20}{29}$

$\cos\alpha = \dfrac{3}{5}$, $\sin\alpha = \dfrac{4}{5}$

$\cos\beta = \dfrac{12}{13}$, $\sin\beta = \dfrac{5}{13}$



(a) $R_x = \Sigma F_x$

$= -T_{BC}\cos\theta - P\cos\alpha + Q\cos\beta = 0$

$\Rightarrow \quad T_{BC} = \dfrac{1}{\cos\theta}[-P\cos\alpha + Q\cos\beta] = \dfrac{29}{21}[-(500\text{ N})\dfrac{3}{5} + (780\text{ N})\dfrac{12}{13}]$

$= 580.0\text{ N} \quad \Rightarrow \quad T_{BC} = 580\text{ N}$

(b) $R_y = \Sigma F_y$

$= T_{BC}\sin\theta - P\sin\alpha - Q\sin\beta = (580\text{ N})\dfrac{20}{29} - (500\text{ N})\dfrac{4}{5} - (780\text{ N})\dfrac{5}{13}$

$= -300\text{ N}$

R = 300 N ↓ ⇒ R의 크기 = R = 300 N