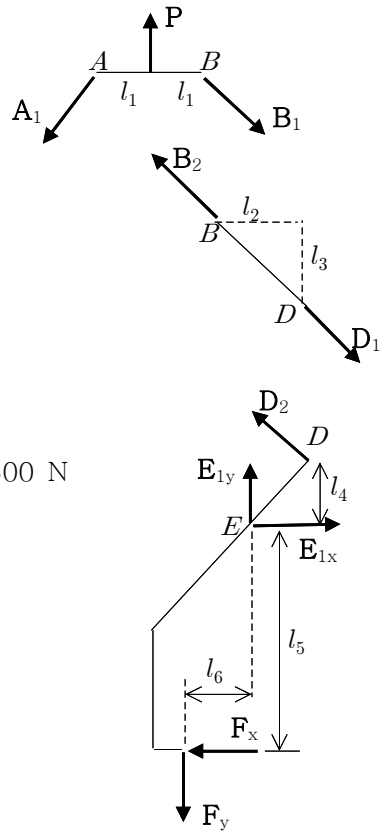
{8.1절}

8.32 P = 500 N, l_1 = 45 mm, l_2 = 90 mm, l_3 = 75 mm,
l_4 = 105 mm, l_5 = 360 mm, l_6 = 157.5 mm



S; two-force body의 힘의 방향 M;

A; 링크 AB에서,

$$B_{1y} = \frac{1}{2}P = \frac{1}{2}(500\text{ N}) = 250\text{ N}$$

연결점 B에서,

$$B_2 = B_1 \;\Rightarrow\; B_{2y} = B_{1y} = 250\text{ N}$$

링크 BD에서, 2力 부재(two-force body)

$$\frac{B_{2y}}{B_{2x}} = \frac{l_3}{l_2} \;\Rightarrow\; B_{2x} = \frac{l_2}{l_3}B_{2y} = \frac{90}{75}(250\text{ N}) = 300\text{ N}$$

$$D_{1x} = B_{2x} = 300\text{ N},\quad D_{1y} = B_{2y} = 250\text{ N}$$

연결점 D에서,

$$D_2 = D_1$$

$$\Rightarrow\; D_{2x} = D_{1x} = 300\text{ N},\quad D_{2y} = D_{1y} = 250\text{ N}$$

링크 DEF에서,

$$F_y = \frac{1}{2}(500\text{ N}) = 250\text{ N},$$

$\Sigma M_E = 0$;

$$-l_5 F_x + l_6 F_y + l_4 D_{2x} + (l_1 + l_2) D_{2y} = 0$$

$$\Rightarrow\; F_x = \frac{l_6 F_y + l_4 D_{2x} + (l_1 + l_2) D_{2y}}{l_5}$$

$$= \frac{(157.5\text{ mm})(250\text{ N}) + (105\text{ mm})(300\text{ N}) + (45+90\text{ mm})(250\text{N})}{360\text{ mm}}$$

$$= 290.6\text{ N}$$

$$F_y = \mu_s F_x \;\Rightarrow\; \mu_s = \frac{F_y}{F_x} = \frac{250\text{ N}}{290.6\text{ N}} = 0.860$$

R; (과정의 타당성 검토) (가령, 다른 평형방정식을 선택하면?)

T; (결과의 의미 검토) (가령, 마찰계수 0.860의 의미, 블록이 미끄러진다면?)