

$$\Sigma M_A = 0 \quad \frac{qa^2}{2} - M + R_{By} \times 2a - F \times 3a = 0$$

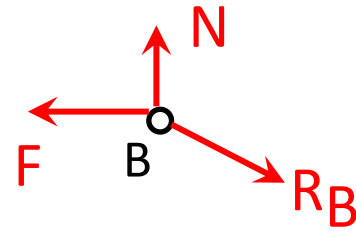
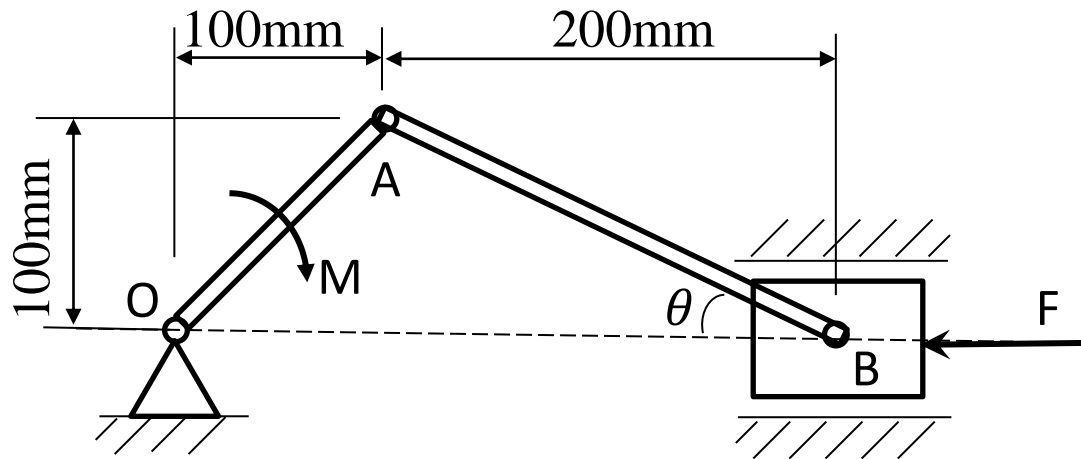
$$\Rightarrow R_{By} = \frac{M}{2a} + \frac{3}{2}F - \frac{qa}{4}$$

$$\Sigma F_x = 0 \quad \Rightarrow R_{Ax} = 0$$

$$\Sigma F_y = 0 \quad -qa + R_{Ay} + R_{By} - F = 0$$

$$\Rightarrow R_{Ay} = \frac{5}{4}qa - \frac{M}{2a} - \frac{F}{2}$$

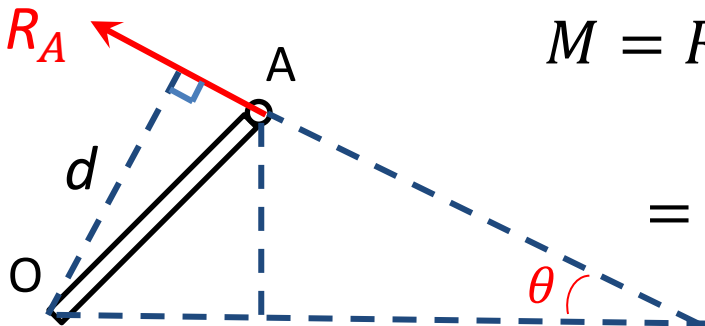
2-19 曲柄滑块机构在如图所示位置平衡，已知滑块上所受的力  $F=400\text{N}$ ，如不计所有杆件的重量，试求作用在曲柄  $OA$  上的力偶矩  $M$ 。

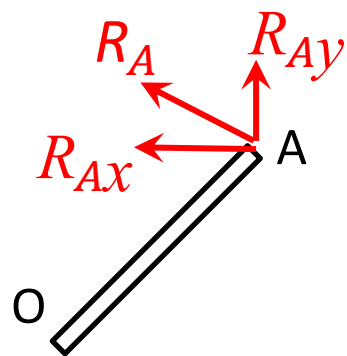
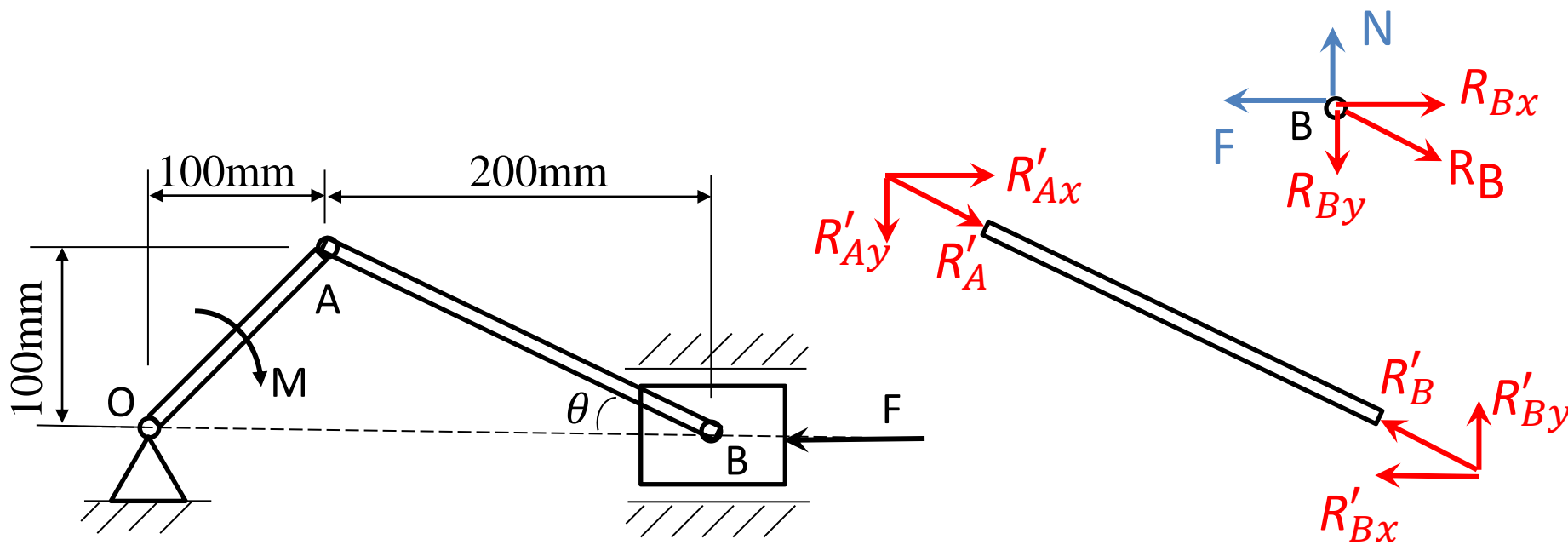


$$\Sigma F_x = 0 \Rightarrow R_B = F / \cos \theta$$

$$M = R_A \cdot d = \frac{F}{\cos \theta} \cdot 300 \cdot \sin \theta = 300F \tan \theta$$

$$= 300 \times 400 \times \frac{1}{2} = 60000 \text{ N} \cdot \text{mm}$$



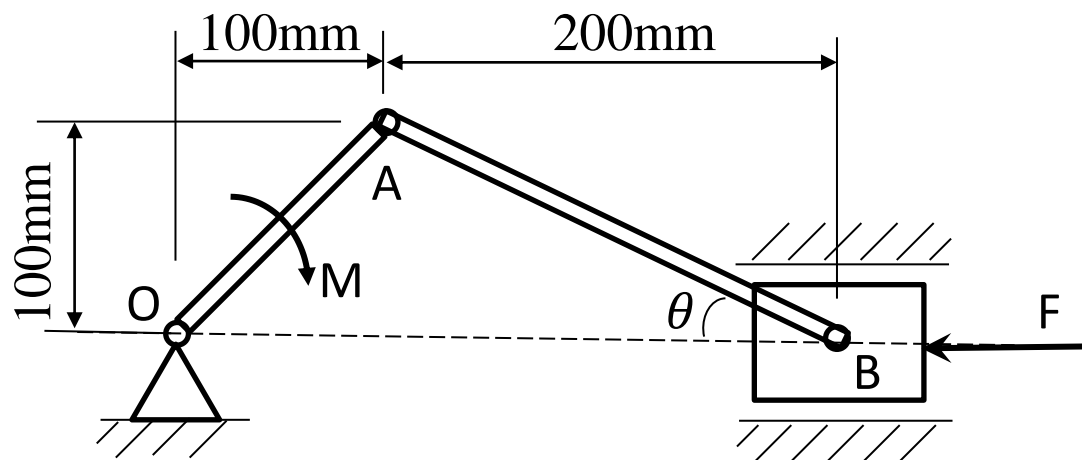


$$R_{Ax} = R'_{Ax} = R'_{Bx} = R_{Bx} = F$$

$$R_{Ay} = R'_{Ay} = R'_{By} = R_{By} = R_B \sin \theta = F \tan \theta$$

$$M = R_{Ax} \times 100 + R_{Ay} \times 100$$

$$= 400 \times 100 + 400 \times \frac{1}{2} \times 100 = 60000 \text{ N} \cdot \text{mm}$$



$$N = R_B \sin \theta = F \tan \theta$$

$$M = N \times 300 = 300F \tan \theta$$

$$= 300 \times 400 \times \frac{1}{2}$$

$$= 60000 \text{ N} \cdot \text{mm}$$

