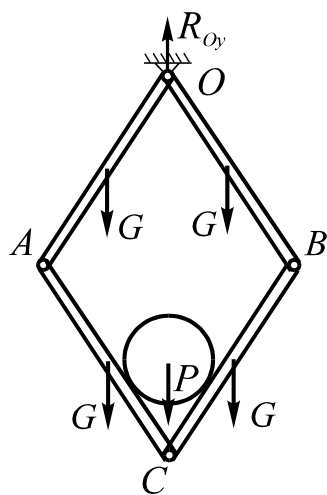
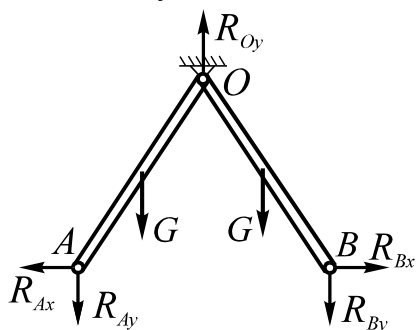


# Задача С-2–2020



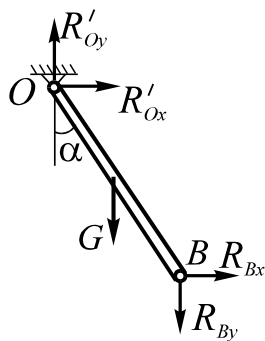
$$R_{Oy} = 4G + P$$



Из симметрии (from symmetry)

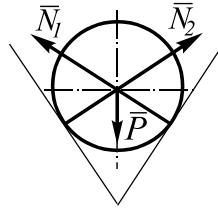
$$R_{Ay} = R_{By}$$

$$R_{Oy} = 2G + 2R_{Ay} \Rightarrow R_{Ay} = \frac{4G + P - 2G}{2} = G + \frac{P}{2}$$



$$\sum M_{iO} = 0; R_{Bx} l \cos \alpha - G \frac{l}{2} \sin \alpha - R_{By} l \sin \alpha = 0$$

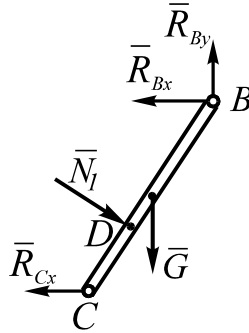
$$R_{Bx} = G \frac{\operatorname{tg} \alpha}{2} + R_{By} \operatorname{tg} \alpha = G \frac{\operatorname{tg} \alpha}{2} + G \operatorname{tg} \alpha + \frac{P}{2} \operatorname{tg} \alpha = (3G + P) \frac{\operatorname{tg} \alpha}{2}$$



$$N_1 = N_2$$

$$P = N_1 \sin \alpha$$

$$N_1 = \frac{P}{2 \sin \alpha}$$



Из симметрии (from symmetry)  $R_{Cy} = 0$

$$\sum M_{iC} = 0; -N \frac{r}{\tan \alpha} - G \frac{l}{2} \sin \alpha + R_{By} l \sin \alpha + R_{Bx} l \cos \alpha = 0$$

$$-\frac{P}{2 \sin \alpha} \cdot \frac{r}{\tan \alpha} - G \frac{l}{2} \sin \alpha + \left(G + \frac{P}{2}\right) l \sin \alpha + (3G + P) \frac{\tan \alpha}{2} l \cos \alpha = 0$$

$$-\frac{P \cos \alpha}{2 \sin^2 \alpha} r - G \frac{l}{2} \sin \alpha + G l \sin \alpha + \frac{P}{2} l \sin \alpha + 3G l \frac{\sin \alpha}{2} + P l \frac{\sin \alpha}{2} = 0$$

$$\frac{P \cos \alpha}{2 \sin^2 \alpha} r = 2G l \sin \alpha + P l \sin \alpha$$

$$r = \frac{(2G + P) l \sin \alpha \cdot 2 \sin^2 \alpha}{P \cos \alpha}$$

$$d = 2r = \frac{4(2G + P) l \sin^3 \alpha}{P \cos \alpha}$$

Если  $d > l \cdot \sin 2\alpha$  (выходит за габариты ромба)

$$\frac{4(2G + P) l \sin^3 \alpha}{P \cos \alpha} \geq 2 l \sin \alpha \cos \alpha$$

$$\frac{4(2G + P) \sin^2 \alpha}{P \cos \alpha} \geq 2 \cos \alpha$$

$$\frac{2(2G + P)}{P} \sin^2 \alpha \geq \cos^2 \alpha$$

$$\tan^2 \alpha \geq \frac{P}{2(2G + P)}$$