

3.



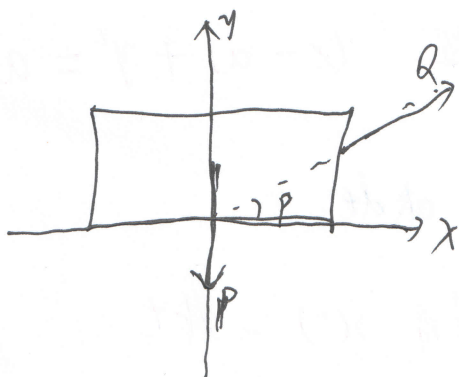
对母指点取力矩平衡,

$$2b \sin p = p(a - b \sin p)$$

$$\text{可得 } \sin p = \frac{ap}{b(p+2)}$$

$$\text{则有 } p = \arcsin \frac{ap}{b(p+2)}$$

4.



$$\sum x: Q \cos p = F_f$$

$$\sum y: 2 \sin p + F_N = p$$

$$\text{补充条件: } F_f = \mu F_N$$

$$\text{以得 } Q = \frac{p}{\cos p + \mu \sin p} \quad \frac{dQ}{dp} = \frac{-p(-\sin p + \mu \cos p)}{(\cos p + \mu \sin p)^2} = 0$$

$$\text{可得 } \sin p = \mu \cos p \quad \text{即 } \tan p = \mu$$

$$p = \arctan \mu$$

$$\text{此时有 } Q = \frac{\mu}{\sqrt{1+\mu^2}} p$$