

Gaya berat

$$\vec{F} = m\vec{a}$$



Jika : $\vec{a} = \vec{g}$ (= percepatan gravitasi)



maka : $\vec{F} = m\vec{g}$ → Gaya gravitasi yang bekerja pada benda

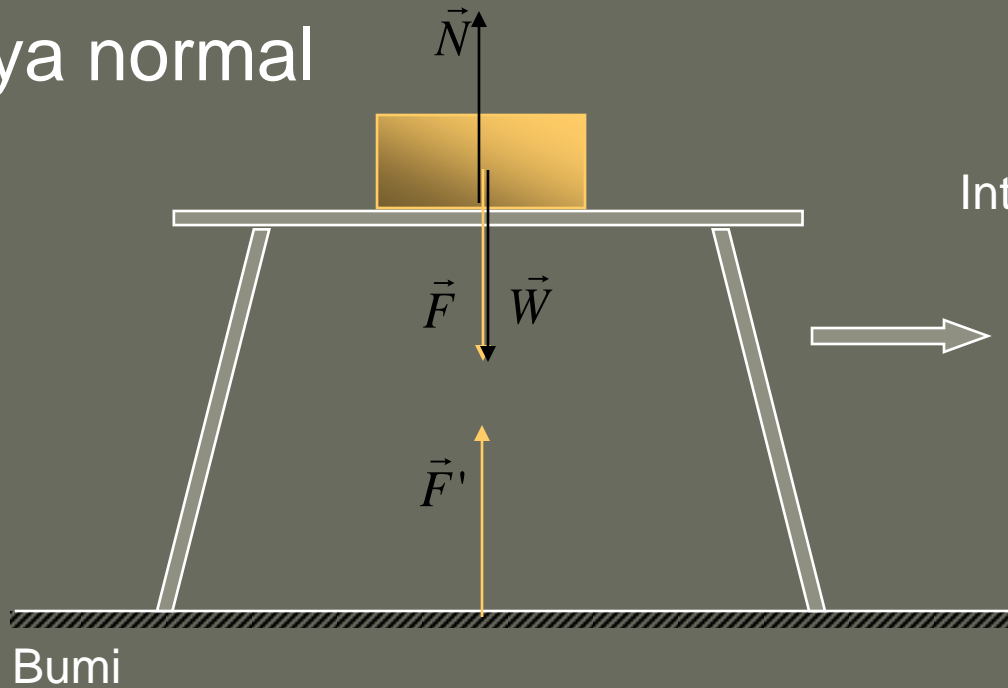


Gaya berat /berat benda



$$\vec{W} = m\vec{g}$$

Gaya normal



Interaksi Benda-bumi :

$$\vec{F} = -\vec{F}'$$

Aksi Reaksi

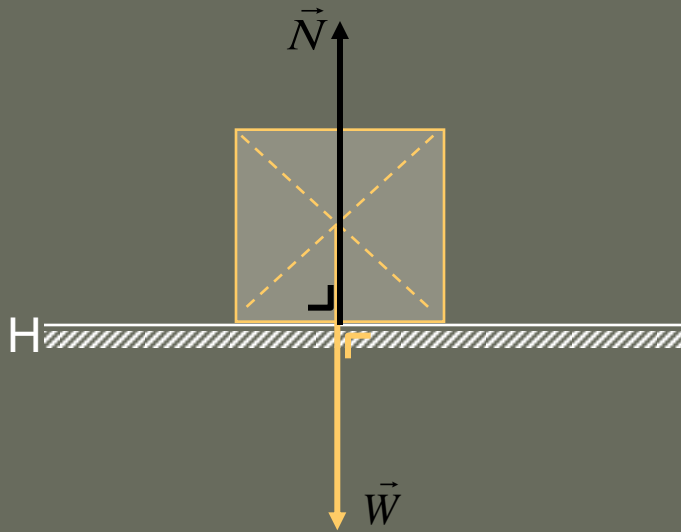
Interaksi benda-daun meja :

$$\vec{W} = -\vec{N} \longrightarrow \vec{N} = -\vec{W} \longrightarrow$$

Aksi Reaksi

$$\vec{W} = \vec{F}$$

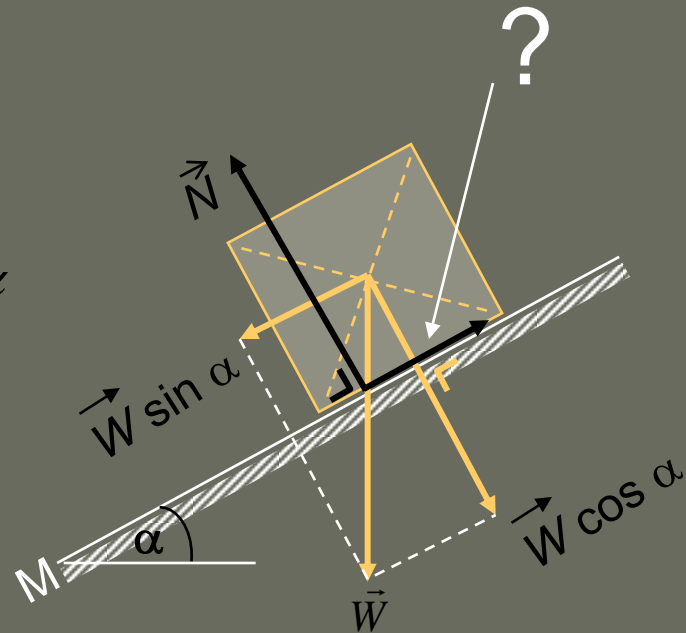
Garis kerja
semua gaya itu
berimpit

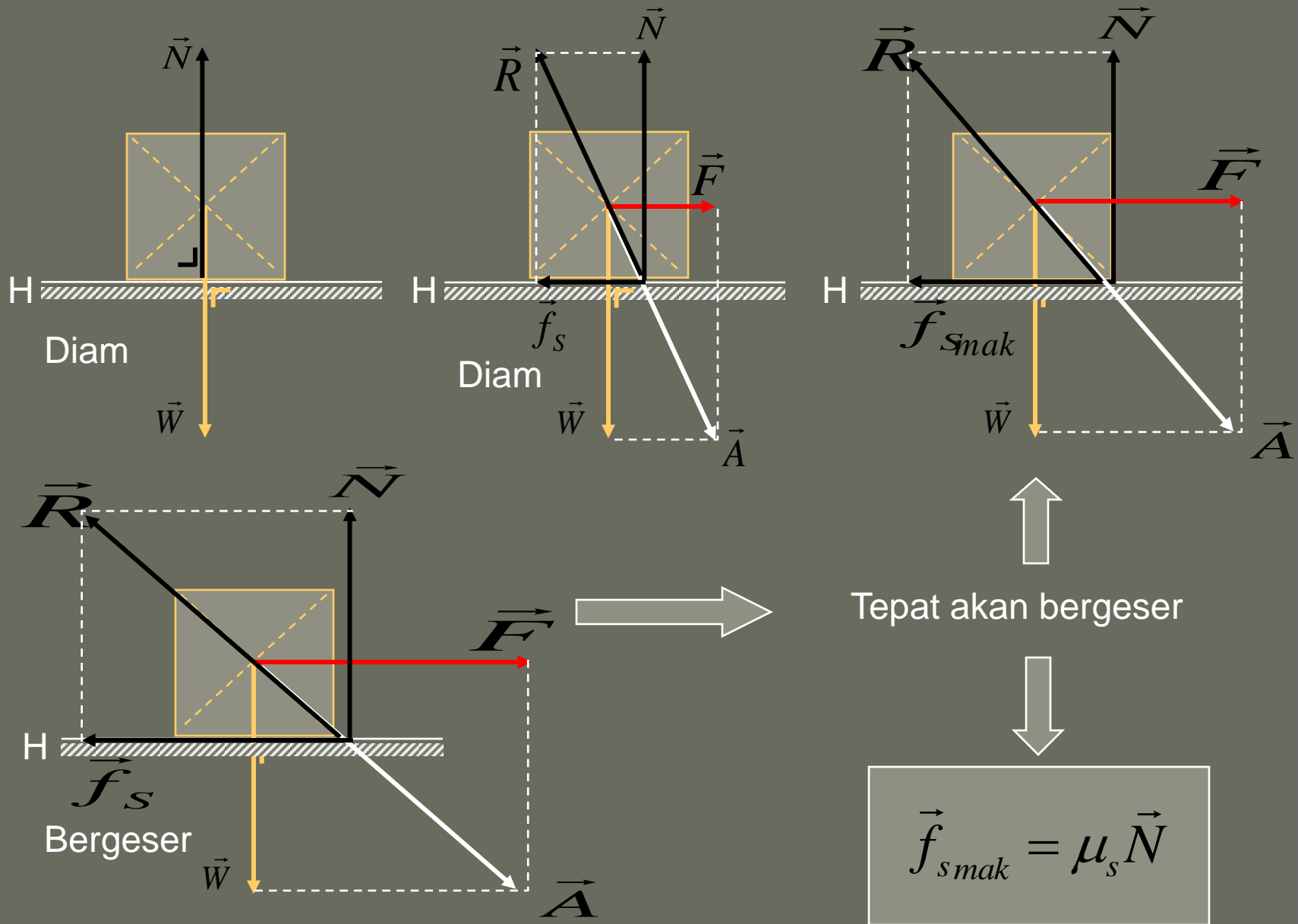


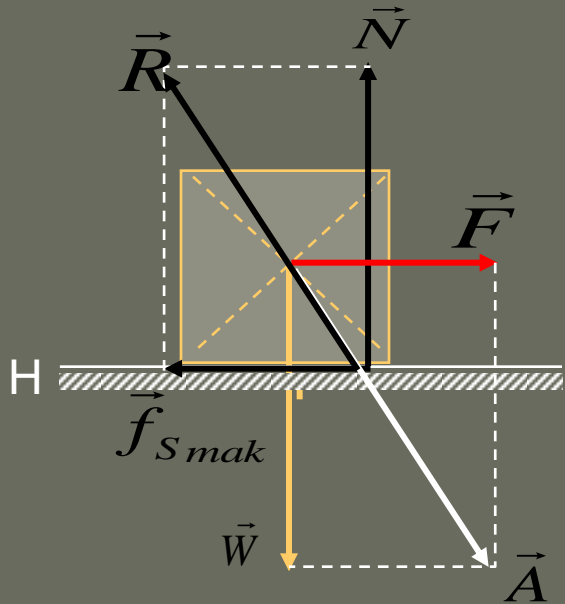
$$\vec{N} = -\vec{W} \Rightarrow N = W$$

$$\vec{N} = -\vec{W} \cos \alpha \Rightarrow N = W \cos \alpha$$

$$- \vec{W} \sin \alpha \quad ?$$







Benda tepat akan bergeser



Jika \vec{F} diperbesar, maka benda bergeser

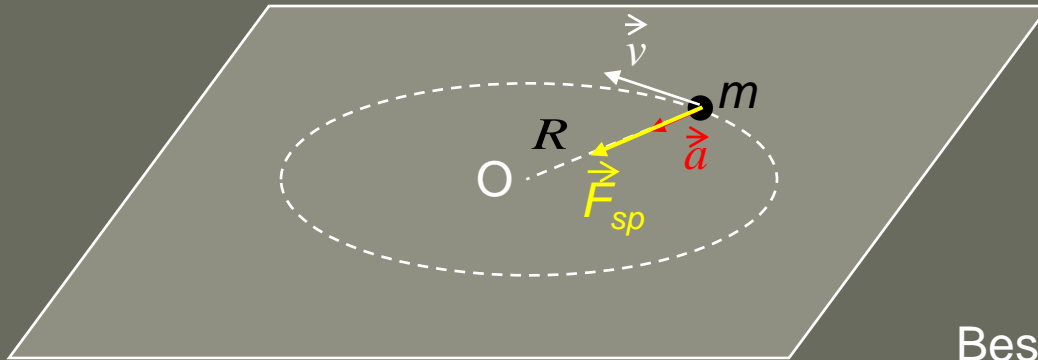


Pada saat benda bergeser :

$$\vec{f}_K = \mu_K \vec{N}$$

$$\vec{f}_K < \vec{f}_{Smak} \quad \rightarrow \quad \mu_K \vec{N} < \mu_S \vec{N} \quad \Rightarrow \quad \mu_K < \mu_S$$

Dinamika gerak melingkar



Besar gaya sentripetal :

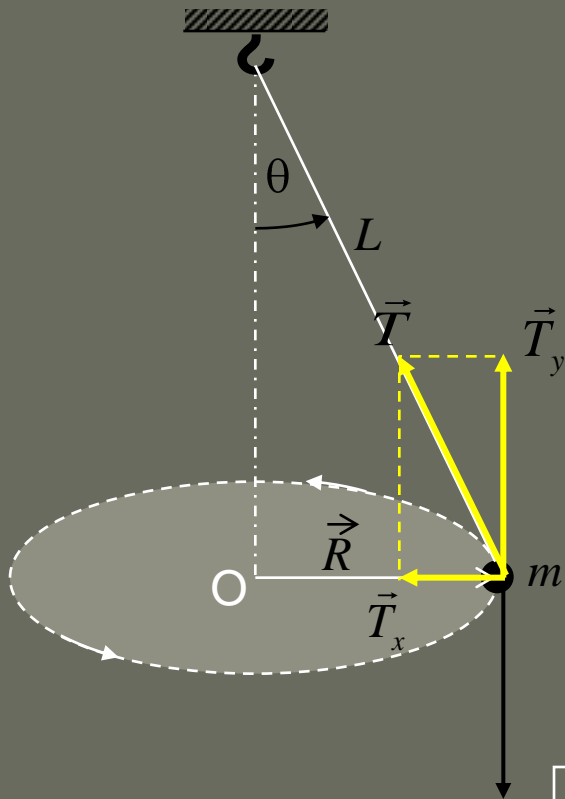
Percepatan sentripetal : $a_{sp} = \frac{v^2}{R}$

Hukum II Newton : $\vec{F} = m\vec{a}$

$$F_{sp} = \frac{mv^2}{R}$$

Arah gaya sentripetal menuju ke pusat lingkaran

Conical Pendulum



$$a_y = 0 \rightarrow T_y = W \Rightarrow T \cos \theta = mg$$

$$a_x = a_{sp} \rightarrow T_x = \frac{mv^2}{R} \Rightarrow T \sin \theta = \frac{mv^2}{R}$$

$$\frac{T \sin \theta}{T \cos \theta} = \frac{\frac{mv^2}{R}}{mg}$$

$$\operatorname{tg} \theta = \frac{v^2}{Rg} \Rightarrow v = \sqrt{Rg \operatorname{tg} \theta}$$

$$T = 2\pi \sqrt{\frac{L \cos \theta}{g}}$$

$$\left. \begin{aligned} v &= \frac{2\pi R}{T} \\ R &= L \sin \theta \end{aligned} \right\}$$

Tugas baca :

- Klasifikasi gaya ; gaya-gaya inersial
- Mekanika klasik, mekanika relativistik dan mekanika kuantum