

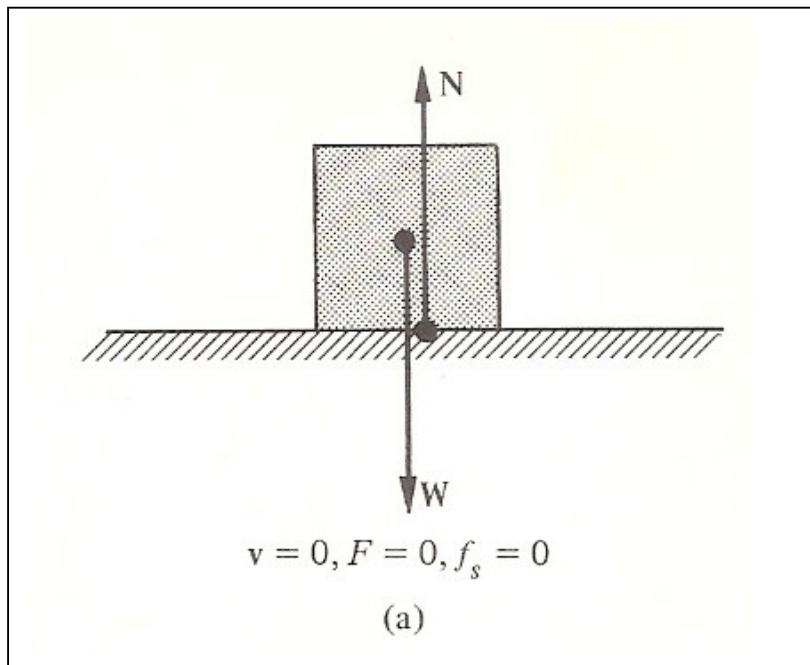
## FRictional FORCES

- Frictional force (Force of friction) is produced when 2 surfaces of bodies are in contact.
- Frictional forces:
  - \*) Static frictional force
  - \*) Kinetic frictional force
- Frictional force is directly proportional to the normal force:

$$f_s \propto N$$

$$f_s = \mu_s N$$

## 1. A block of mass $m$ resting on a table



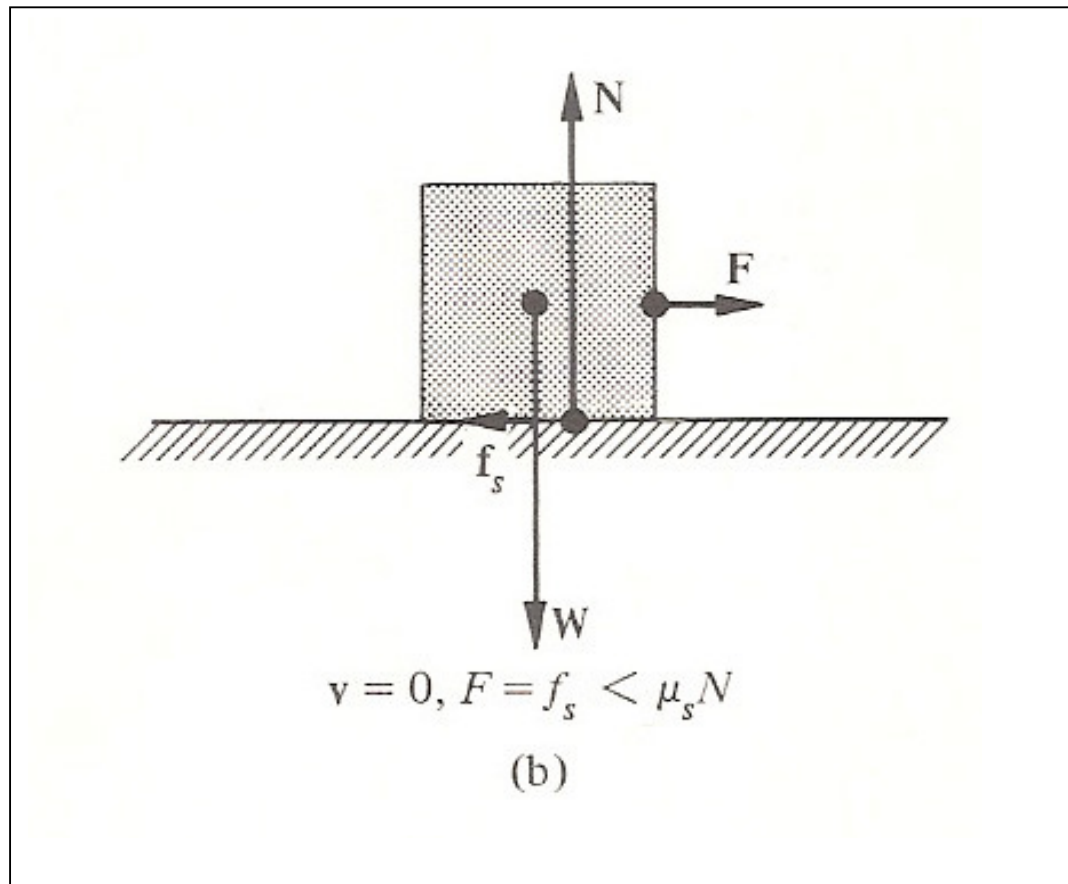
The weight of the block:  $W = m \cdot g$

The normal force :  $N = W$

Static frictional force:  $f_s = 0$

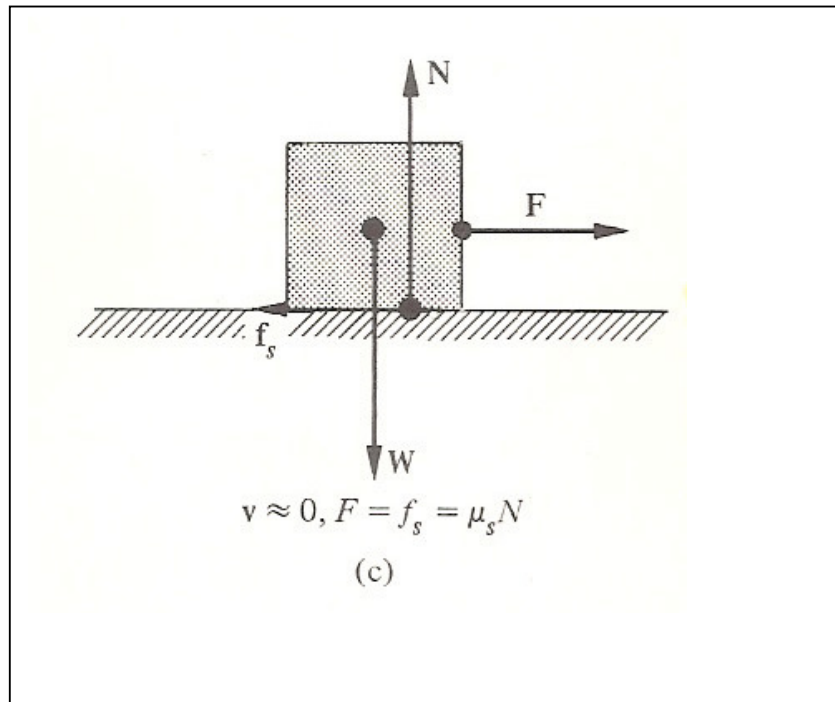
Pada kondisi seperti ini, tidak terdapat gaya gesek.

2. A block of mass  $m$  is applied with a small horizontal force



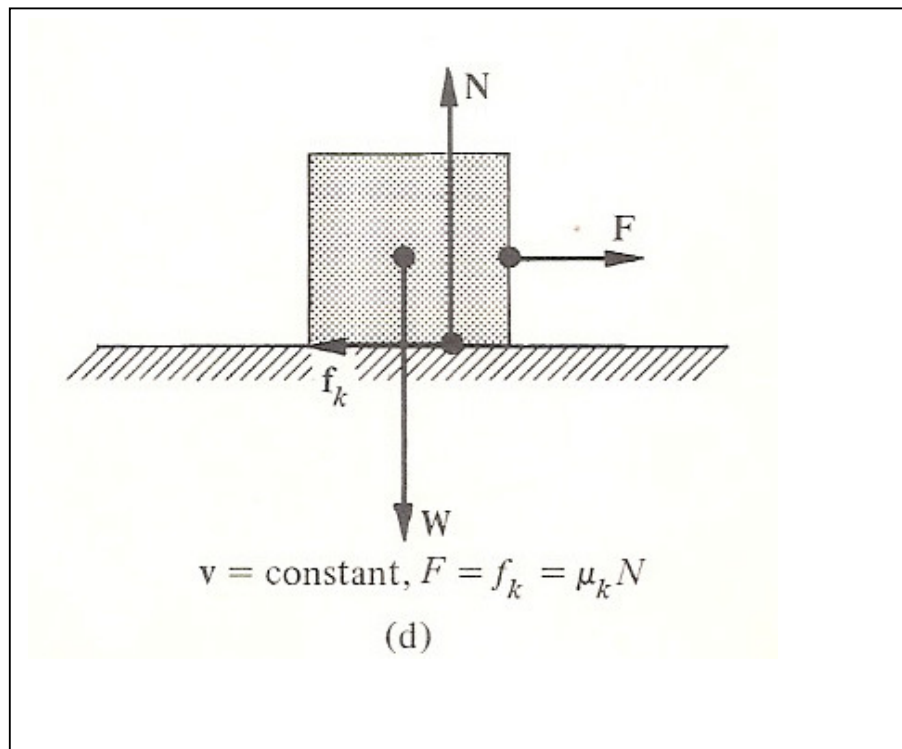
- $f_s$  may increase in line with the force  $F$ .
- **So,**  $f_s$  is called “Self-adjusting force”.

3. A block of mass  $m$  just start to move when applied with a small horizontal force.

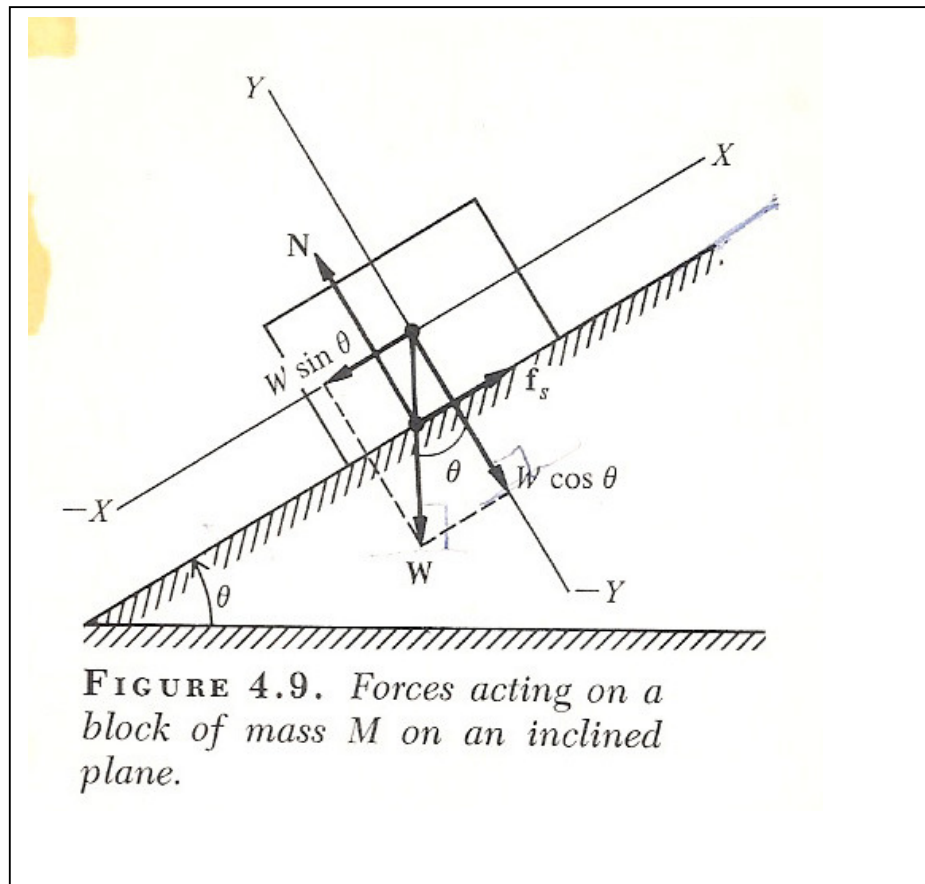


- *If  $f_s$  reach maximum value.*
- *The block just start to move.*

4. A block of mass  $m$  is moving with constant velocity when applied with a horizontal force.



- The block is moving with a constant velocity of  $v$
- $f_k = \mu_k N$



$$f_s = W \sin \theta$$

$$f_s = \mu_s N \rightarrow N = W \cos \theta$$

$$\begin{aligned} \mu_s &= W \sin \theta : W \cos \theta \\ &= \sin \theta : \cos \theta \end{aligned}$$

$$\mu_s = \tan \theta$$

