

\* Nu Bv E:  $\sum E_{in} = \sum E_{out}$  in Nm of J


plaatsenergie  $E_z = mgh$  en kinetische energie  $E_k = \frac{1}{2}mv^2$

vb vrije val

vb achtbaan (glad)

h:  $E_z \rightarrow E_k$

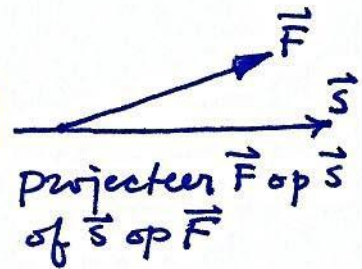
$$(mgh + \frac{1}{2}mv^2)_1 = (mgh + \frac{1}{2}mv^2)_2$$

  $v = \sqrt{2gh}$

\* Arbeid W verandert  $E_k$

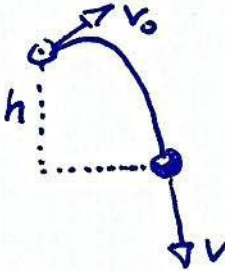
$$E_{k,1} + \sum W = E_{k,2}$$

$$\text{met } W = \vec{F}_s \cdot \vec{s}$$



$\sum W < 0$

vb gooi met wrijving

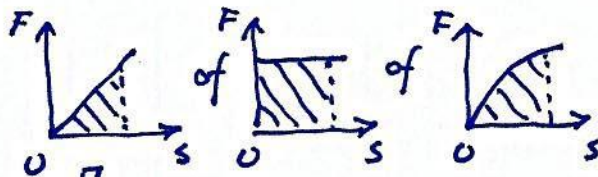


$$\frac{1}{2}mv_0^2 + mgh + F_w \cdot s = \frac{1}{2}mv^2$$

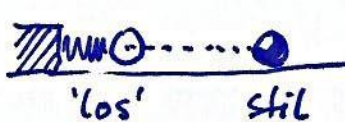
$F_w$  is hier tegen  $\vec{s}$  in gericht

$$F_w = F_L = \frac{1}{2} \rho C_w A v^2$$

\* Bepaling W  
via opp in  $(F, s)$



vb veer:  $F_v = c \cdot u \rightarrow E_v = \frac{1}{2}cu^2$

  $0 + \frac{1}{2}cu^2 + F_w(u+s) = 0$

$$F_w \leq \mu F_n$$

\* vermogen  $P = \frac{W}{t} = F \cdot v$

$$\eta = \frac{P_{nuttig}}{P_{in}} = \frac{E_{nuttig}}{E_{in}}$$

\* Stookwaarden  $r_m$  in J/kg en  $r_v = J/m^3$  in BINAS 28 B