ES. N32 PAG 158

$m = 47{,}0\ g$

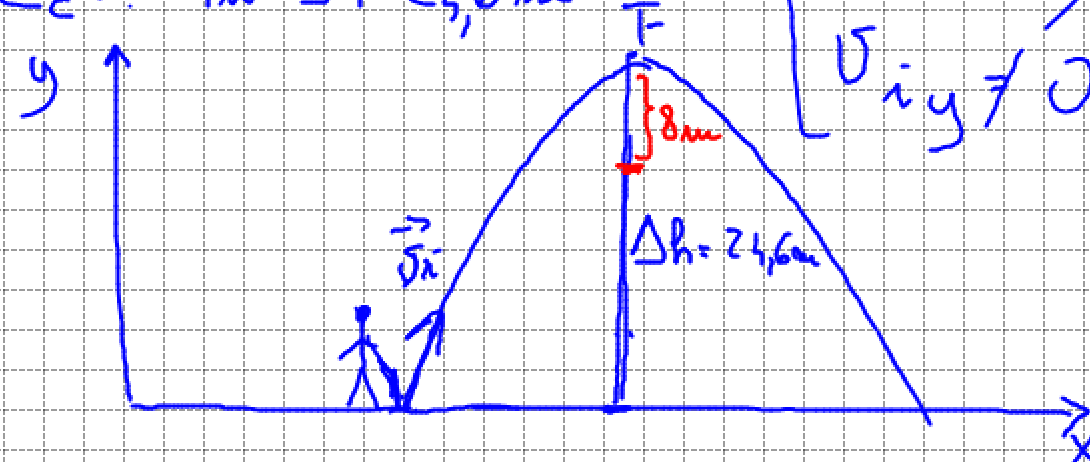
$v_i = 52{,}0\ m/s$

$\Delta h = 24{,}6\ m$

$E_c = ?$ in $\Delta h = 24{,}6\ m$

$$E_c = \frac{1}{2} m v^2$$

$$\begin{cases} v_{i_x} = v_{f_x} \quad v_{f_y} = 0 \\ v_{i_y} \neq 0 \end{cases}$$



$$E_{(i)} = K_i$$

$$E_{(f)} = K_{(f)} + U_f$$

$$E_{(i)} = E_{(f)}$$

$$K_i = \frac{1}{2} m v_i^2 = \frac{1}{2} \cdot 0{,}047\,kg \cdot \left(52{,}0\,\frac{m}{s}\right)^2 =$$

$$= 63{,}5\ J$$

$$E_{(f)} = K_{(f)} + U_{(f)} = \frac{1}{2} m v_{f(x)}^2 + m g \Delta h =$$

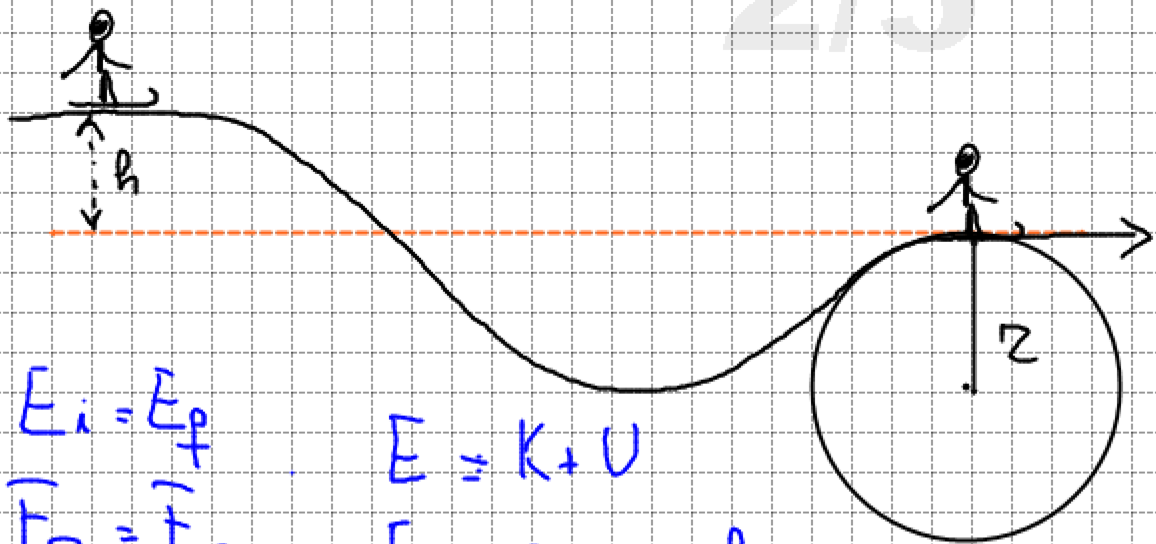
$$= \frac{1}{2}\, 0{,}047\,kg\ v_{f(x)}^2 + 0{,}047\,kg\ 9{,}81\,\frac{m}{s^2}\ 24{,}6\,m$$

$$E_{(i)} = E_f \qquad K_{(f)} = E_{(i)} - U_{(f)}$$

$$K_{(f)} = K_{(i)} - U_{(f)}$$

ES N 40

$r = 36\ m$



$$\begin{cases} E_i = E_f \\ \bar{F}_p = \bar{F}_c \end{cases}$$

$$E = K + U$$

$$E_i = 0 + mgh$$

$$E_f = \frac{1}{2} m v_f^2 + 0$$

$$\begin{cases} \cancel{m} g h = \frac{1}{2} \cancel{m} v_f^2 \\ \cancel{m} g = \cancel{m} \frac{v_f^2}{r} \end{cases} \qquad \begin{cases} h = \frac{1}{2} \frac{r \cancel{g}}{\cancel{g}} \\ v_f = \sqrt{rg} \end{cases}$$

$$h = \frac{1}{2} r = 18\ m$$

ES N 47 PAG 160

$m = 3{,}00 \times 10^2\ kg$

$\Delta h = 10{,}0\ m$

$v =$ costante

$P = 4{,}00 \times 10^2\ W$

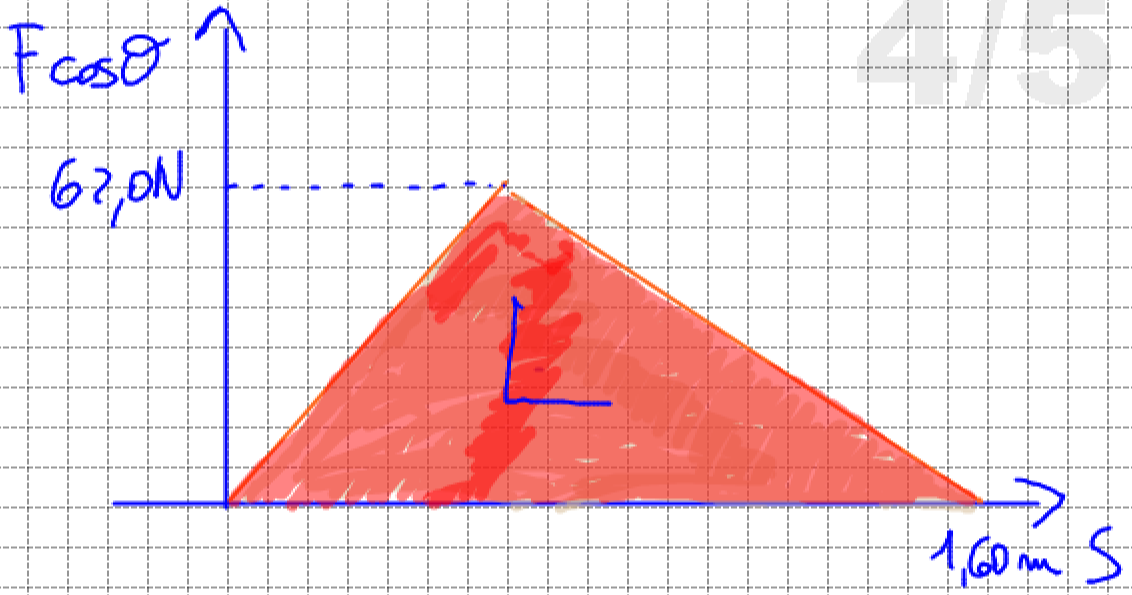
$$P = \frac{L}{\Delta t} \qquad \Delta t = \frac{L}{P} \qquad L = F \Delta h$$

$$L = mg\Delta h = 3{,}00 \times 10^2\ kg \times 9{,}81\ m/s^2 \times 10{,}0\ m =$$

$$= 29400\ J = 2{,}94 \times 10^4\ J$$

$$\Delta t = \frac{2{,}94 \times 10^4\ J}{400\ W} = 73{,}5\ s.$$

ES N 53 PAG 160



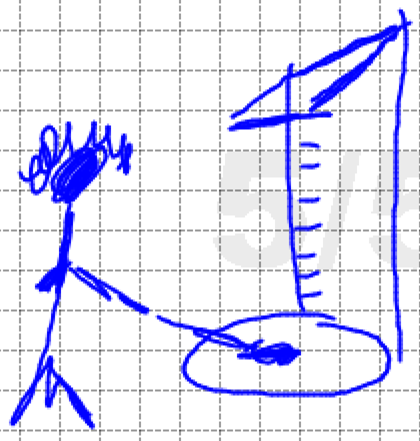
$$L = \frac{1}{2} \times 1{,}60\,m \times 67{,}0\,N = 49{,}6\ N \cdot m$$

N 77

$\Delta h = 5,0\ m$

$M = 9,0\ kg$ (MARTELLO)

$m = 0,4\ kg$ (CILINDRO)



25% energia cinetica del martello è trasferita al cilindro di metallo.

$v = ?$

$$E_i = E_f \qquad h_i = 0\ m$$

$$E_i = K_i + U_i \qquad \text{MARTELLO} \quad K_i = \frac{1}{2} M v_i^2 + m g h_i =$$

$$= \frac{1}{2} M v_i^2 + 0 =$$

$$= \frac{1}{2} 9,0 \cdot v_i^2$$

$E_f = ?$ siccome l'energia meccanica del martello non si conserva allora $E_f \neq E_i$

CILINDRO: $E_i = K_i + U_i$

$$K_i = \frac{1}{2} m v_i^2 = 0,25 \frac{1}{2} M v_i^2 \qquad U_i = m g h_i = 0$$

$$E_f = K_f + U_f \qquad K_f = \frac{1}{2} m v_f^2 \quad v_f = 0\ \frac{m}{s}$$

$$K_f = 0$$

$$U_f = m g \Delta h$$

L'energia meccanica si conserva:

$$\frac{1}{8} M v_i^2 = m g \Delta h.$$