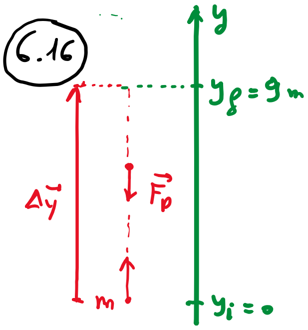
6.16



(a). $W_{\vec{F_p}} = \vec{F_p}\cdot\Delta\vec{y} = F_p\cdot\Delta y\cdot\cos\theta = -mg\,\Delta y = -0{,}15\cdot 9{,}81\cdot 9 \cong \underline{\underline{-13{,}2\ \text{J}}}$

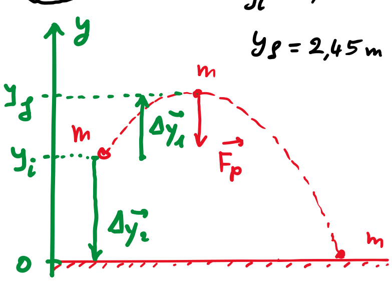
$\theta = 180°$

(b). $\Delta E_{pot} = E_{pot\,f} - E_{pot\,i} = mg\,y_f - mg\,y_i = mg\,(y_f - y_i)$

$= \underline{\underline{+13{,}2\ \text{J}}}$

On voit que $\Delta E_{pot} = -W_{\vec{F_p}}$

6.17



$y_i = 1{,}75$ m

$y_f = 2{,}45$ m

(a). $W_{\vec{F_p}} = \vec{F_p}\cdot\Delta\vec{y}_1 = F_p\,\Delta y_1\cos\theta = -F_p\,\Delta y_1 = -mg\,(y_f - y_i)$

$\theta = -180°$

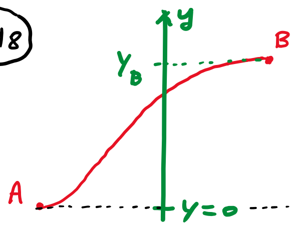
$= -7\cdot 9{,}81\cdot(0{,}7)$

$= \underline{\underline{-48\ \text{J}}}$

(b). $\Delta E_{pot} = E_{pot\,f} - E_{pot\,i} = mg\cdot 0 - mg\,y_i = -7\cdot 9{,}81\cdot 1{,}75$

$= \underline{\underline{-1{,}2\cdot 10^{2}\ \text{J}}}$

6.18



$y_A = 0$ m

$y_B = 15$ m

Théorème de l'énergie cinétique:

$\Delta E_{cin\,A\to B} = W_{\Sigma\vec{F}\,A\to B}$

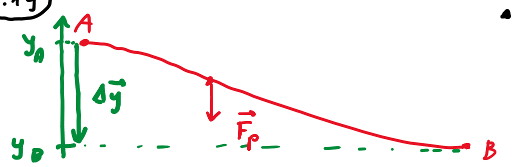
$W_{frottements} = -2{,}0\cdot 10^{4}\ \text{J}$

$W_{moteur} = +3{,}0\cdot 10^{4}\ \text{J}$

$W_{\vec{F_p}} = \vec{F_p}\cdot\Delta\vec{y} = F_p\,\Delta y\cos\theta = -mg\,y_B = -5{,}5\cdot 10^{4}\ \text{J}$

$\Rightarrow \Delta E_{cin\,A\to B} = (-2{,}0 + 3{,}0 - 5{,}5)\cdot 10^{4} \cong \underline{\underline{-4{,}5\cdot 10^{4}}}\ \text{J}$

6.19



- La donnée laisse penser que le skater descend!

  $\Rightarrow y_B < y_A$

- Théorème de l'énergie mécanique : $\Delta E_{cin} + \Delta E_{pot} = W_{\vec{F}_{NC}}$ (1)

(a). De (1) : $\Delta E_{pot} = W_{\vec{F}_{NC}} - \Delta E_{cin} = +80 - 265 - (E_{cin\,B} - E_{cin\,A}) = -185 - (36 - 1{,}8^2)\frac{1}{2}\,m$

$\cong \underline{\underline{-1085}}\ \text{J}$

(b). $\Delta E_{pot} = mg\,\Delta y \Rightarrow \Delta y = \dfrac{\Delta E_{pot}}{mg} = -\dfrac{1085}{55\cdot 9{,}81} = \underline{\underline{-2{,}0\ \text{m}}}$