(3.26)

a). $x_f = v_i \cos 50 \cdot t$

Il faut d'abord calculer le temps de vol t : $\Delta y = y_f - y_i = -4,9t^2 + v_i \sin 50 . t$

$-730 = -4,9t^2 + v_i \sin 50 . t$

$4,9t^2 - v_i \sin 50 . t - 730 = 0$

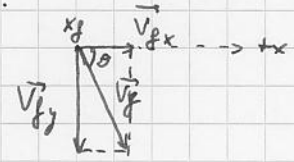
$v_i = \frac{350}{3,6}$

$t'_{,,} = \frac{v_i \sin 50 \pm \sqrt{(v_i \cos 50)^2 + 4.4,9.730}}{9,8}$ (STOB) $= \begin{cases} \nearrow \sim 21,98 s \\ \searrow < 0 \text{ exclu !} \end{cases}$

$(v_i \sin 50° = STOA)$

$\Rightarrow x_f = v_i \cos 50 . t \simeq \underline{1373,6 m}$

b).



$v_{fx} = v_i \cos 50° \simeq 62,49 m/s$

$g = \frac{v_{fy} - v_{iy}}{t} \Rightarrow -9,8 = \frac{v_{fy} - v_i \sin 50°}{t} \Rightarrow v_{fy} = v_i \sin 50° - 9,8.t \simeq -140,93$ m/s

$\Rightarrow v_f = \sqrt{v_{fx}^2 + v_{fy}^2} \simeq \underline{154,2 m/s}$

c). $\text{tg}\,\theta = \frac{-140,93}{62,49} \Rightarrow \theta = \text{Arctg}\left(-\frac{140,93}{62,49}\right) \simeq \underline{-66,1°}$ ou $66,1°$ au-dessous de l'horizontale

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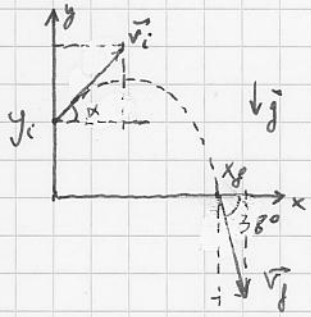
(3.28)



a). $-9,8 = \frac{v_{fy} - v_{iy}}{t}$ On ne connaît pas le temps de vol t !

$v_{fy}^2 - v_{iy}^2 = 2.(-9,8).\Delta y$ On ne connaît pas Δy !

$\begin{cases} v_{fx} = v_f \cos 38° \\ \quad = v_i \cos\alpha = v_{ix} \end{cases} \Rightarrow x_f = v_f \cos 38° . t \Rightarrow t = \frac{x_f}{v_f \cos 38°} = \frac{55}{25.\cos 38°}$

$\simeq 2,79 s$ (A)

Donc $v_{ix} = v_f \cos 38° \simeq 19,7 m/s$ (B)

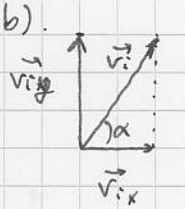
on suppose $\alpha > 0$

$\frac{-v_{iy} - v_{fy}}{t} = -9,8 \Rightarrow -v_{fy} - v_{iy} = -9,8.t \Rightarrow v_{iy} = -v_{fy} + 9,8.t = -v_f \sin 38 + 9,8.t \simeq 12,0 m/s$ (c)

(> 0) donc $\alpha > 0$!

$\Rightarrow v_i = \sqrt{v_{ix}^2 + v_{iy}^2} \simeq \underline{23,1 m/s}$

b).



$\alpha = \text{Arctg}\left(\frac{v_{iy}}{v_{ix}}\right) \simeq \underline{31,3°}$ au dessus de l'axe x