T4 $\Delta t = 8\,h$

$v = 4\,km/h$

$\Delta E = 17{,}3\,MJ = 17{,}3 \cdot 10^6\,J = 1{,}73 \cdot 10^7\,J = W_{F_{rad}}$

$W = \Delta E$

$W = F \cdot \Delta x \cdot \cos\alpha$

? $F_{radiateur} = \dfrac{W_{F_{rad}}}{\Delta x \cdot \cos\alpha} = \dfrac{1{,}73 \cdot 10^7}{36000 \cdot \cos 0°} = 480{,}56\,N$

? $\Delta x = v \cdot \Delta t = 4 \cdot 8 = 36\,km = 36000\,m$

$\dfrac{km}{h} \cdot h$

4 km en 1 h ↓ ×8

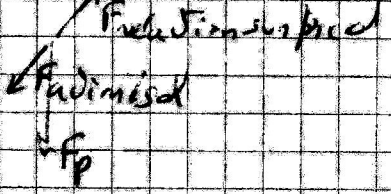
36 km en 8 h ↓ ×8

? $\alpha = 0°$

$F_{rad.}$ ↑ A → Δx

T5 $F_p = 450\,N$

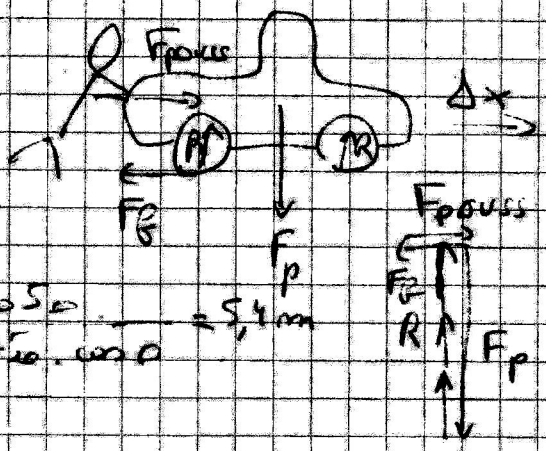
$\Delta x = 3 \times 3\,cm = 9\,cm$



T6 $W = 4050\,J$

$F_p = 7500\,N$

$F_f = \dfrac{10}{100} F_p$



? $\Delta x = \dfrac{W_{F_{pouss}}}{F_{pouss} \cdot \cos\alpha} = \dfrac{4050}{750 \cdot \cos 0} = 5{,}4\,m$

$W_{F_{pouss}} = F_{pouss} \cdot \Delta x \cdot \cos\alpha$

$F_{pouss} = F_f = \dfrac{10}{100} \cdot 7500 = 750\,N$

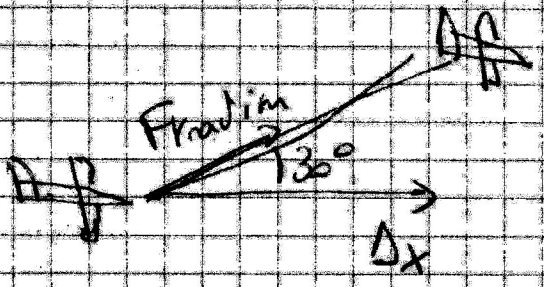
car vit. const. a = 0

donc $F_{tot} = 0$

voir schéma

A = D

T7



$v = 250$ km/h

$F_{radim} = 15000$ N

$\alpha_{F/\Delta x} = 30°$

$\Delta x = 1$ km $= 1000$ m

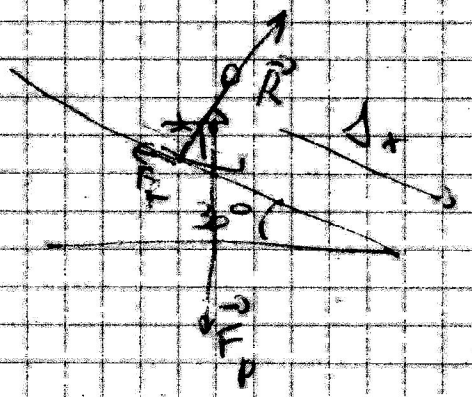
$F_f = 0$

$W = F . \Delta x . \cos\alpha$

$= 15000 . 1000 . \cos 30$

$= 12990381$ J

Ty



$m = 25$ kg

$\Delta x = 10$ m

$F_p = \frac{1 m}{10 m} F_p$

$W_{F_p} = F_p . \Delta x . \cos\alpha_{F_p/\Delta x} = 250 . 10 . \cos 60 = 1250$ J

travail moteur

$F_p = m . g = 25 . 10 = 250$ N

$\alpha = 60°$

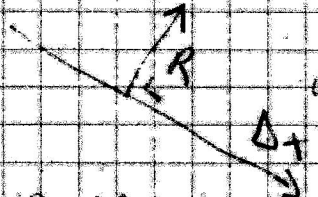
$W_{F_f} = F_f . \Delta x . \cos\alpha_{F_f/\Delta x} = 25 . 10 . \cos 180 = -250$ J

travail résistant

$F_f = \frac{1}{10} F_p = \frac{1}{10} 250 = 25$ N

$\alpha = 180°$

$W_R = R . \Delta x . \cos 90 = 0$ J travail nul



$\alpha = 90°$ $W = 0$

Quelle énergie aura-t-il gagné ? type et valeur

cinétique

$W = \Delta E = W_{F_p} + W_{F_f} + W_R = 1250 - 250 + 0 = 1000$ J

T5 a) $m = 2{,}5\ kg$ $F_p = m.g = 20.10 = 200\ N$

$\Delta x = 5\ m$ $\alpha_{F_p \Delta x} = 90°$ $W = F_p . \Delta x . \cos \alpha_{F_p \Delta x}$

$= 200 . 5 . \cos 90 = 0\ J$

b) $\alpha_{F_p \Delta x} = 105°$ $W_{F_p} = F_p . \Delta x . \cos \alpha$

$= 200 . 5 . \cos 105\ J$

$= 200 . 5 . \cos 105\ J$

$= -258{,}8\ J$

c) $\alpha_{F_p \Delta x} = 75°$ $W_{F_p} = F_p . \Delta x . \cos \alpha = 200 . 5 . \cos 75$

$= 258{,}8\ J$

T10

$\Delta x_{descente} = 50\ m$

$m = 25\ kg$

$W_{F_p} = -W_{F_p}$

$\oplus$ moteur $\ominus$ résistant

Δx descente Δx montée

$W_{F_p descente} = F_p . \Delta x . \cos \alpha$

$= 250 . 50 . \cos 70 = 4275\ J$

$F_p = m . g = 25 . 10 = 250\ N$

$\alpha_{F_p \Delta x} = 180°$

$\Delta x_{montée} = \dfrac{W_{F_p montée}}{F_p . \cos \alpha} = \dfrac{-4275\ J}{250 . \cos 180} = 17{,}1\ m$

$W_{F_p montée} = F_{p\ montée} . \Delta x . \cos \alpha$

$\alpha_{F_p \Delta x} = 180°$