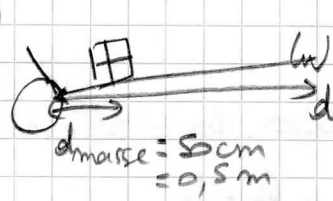
1. a)



b) $AM = \frac{d_{main}}{d_{masse}} = \frac{1{,}2}{0{,}5} = 2{,}4$ x + loin

c) $F_{main\ petite} = F_{charge\ grande} / A.M. = \frac{500}{2{,}4} = 208{,}3\,N$

$F_{charge} = G_{charge} = m \cdot g = 5 \cdot 10 = 500\,N$

$m_{masse} = 50\,kg$

d) $\Delta x_{main\ petit} = \Delta x_{charge\ grand} \cdot AM = 0{,}1 \cdot 2{,}4 = 0{,}24\,m = 24\,cm$

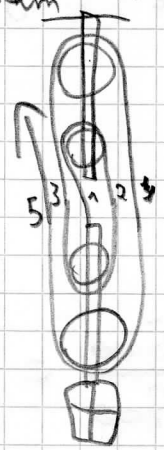
$\Delta x_{charge} = 10\,cm = 0{,}1\,m$ vers le haut (voir schéma)

e) $W_{main} = F_{main} \cdot \Delta x_{main} = 208{,}3 \cdot 0{,}24 = 49{,}992\,J$ } le même avec et sans machine

$W_{charge} = F_{charge} \cdot \Delta x_{charge} = 500 \cdot 0{,}1 = 50\,J$

2. $m_{charge} = 500\,kg$ $F_{charge} = G_{charge} = m \cdot g = 500 \cdot 10 = 5000\,N$

$F_{main} = 1000\,N$ 5x + facile donc 5 fils porteurs



b) $AM = \frac{F_{charge}}{F_{main}} = \frac{5000}{1000} = 5$x + facile

= 5 fils porteurs

c) $\Delta x_{main} = 2\,m$

$\Delta x_{charge\ petit} = \Delta x_{main\ gd} / AM = 2/5 = 0{,}4\,m$

d) $W_{main} = F_{main} \cdot \Delta x_{main} = 1000 \cdot 2 = 2000\,J$

$W_{charge} = F_{charge} \cdot \Delta x_{charge} = 5000 \cdot 0{,}4 = 2000\,J$

3. a) $m = 3,5\ T = 3500\ kg$

$F_{charge} = G_{charge} = m \cdot g = 3500 \cdot 10 = 35000\ N$

$F_{câble} = 5000\ N$ 7x + facile

c) $AM = \frac{F_{charge}}{F_{câble}} = \frac{35000}{5000} = 7x$ + facile
7x + long

b) $L = \Delta x_{sur\ pl\ plan} = \Delta x_{direct\ petit} \cdot AM = 45 \cdot 7 = 315\ m$

$\Delta x_{direct} = h = 45\ m$

d) $W_{plan} = F_{plan} \cdot \Delta x_{plan} = 5000 \cdot 315 = 1575000\ J$

$W_{direct} = F_{direct} \cdot \Delta x_{direct} = 35000 \cdot 45 = 1575000\ J$

4. $W_{main} = 3500\ J$ $m = 70\ kg$

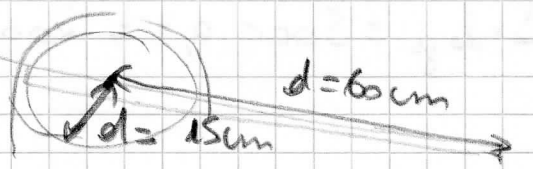
$F_{direct} = G_{charge} = m \cdot g = 70 \cdot 10 = 700\ N$

poulie simple
1 fil porteur
AM = 1x + faible
$F_{direct} = F_{main}$

$W = F \cdot \Delta x$; $\Delta x_{charge} = \frac{W}{F} = \frac{3500}{700} = 5\ m = \Delta x_{fil}$

5.

$AM = \frac{\Pi_{main\ pl}}{\Pi_{corde\ petit}} = \frac{0,6\ m}{0,15\ m}$
$= 4x$ + loin



$F_{main\ petit} = F_{charge\ pl} / AM = \frac{5500}{4} = 1375\ N$

$F_{charge} = G_{charge} = 550 \cdot 10 = 5500\ N$

$\Delta x_{charge} = 12\ m$

$\Delta x_{main\ pl} = \Delta x_{charge} \cdot AM$
$= 12 \cdot 4 = 48\ m$

$W = F \cdot \Delta x = 5500 \cdot 12$
$= 1375 \cdot 48$
$= 66000\ J$

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5. $F_{direct} = G = m \cdot g = 100 \cdot 10 = 1000\ N$

$\Delta x_{direct} = 8\ m$

$W = F \cdot \Delta x = 1000 \cdot 8 = 8000\ J$ D.

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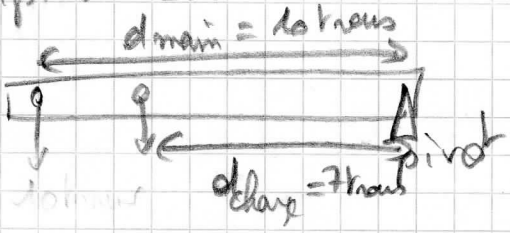
7.



$AM = \frac{d_{main}}{d_{charge}} = \frac{10}{7} = 1,43\times$ + loin

$F_{direct} = G_{charge} = m \cdot g = 0,6 \cdot 10 = 6\ N$

$m_{à\ soulever} = 100\ g + 500\ g = 600\ g = 0,6\ kg$

$F_{main} = \frac{F_{direct}}{AM} = \frac{6}{1,43} = 4,19\ N$ C