

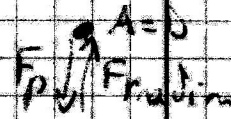
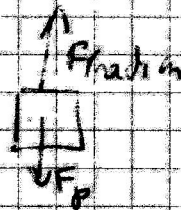
M0 $m = 20 \text{ kg}$

$\Delta x = 50 \text{ cm} = 0,5 \text{ m}$

$F_{\text{traction}} = F_p = m \cdot g = 20 \cdot 10 = 200 \text{ N}$

car vit constante
 $a=0$ donc $F_{\text{rot}}=0$

$A=0$ voir schéma



$F_{\text{traction}} \Delta x$ $\alpha_{F, \Delta x} = 0^\circ$

$W = F_{\text{traction}} \cdot \Delta x \cdot \cos \alpha = 200 \cdot 0,5 \cdot \cos 0^\circ = 100 \text{ J}$

M1 Levier

$GM = \frac{\text{longueur bras de force}}{\text{longueur bras de charge}} = \frac{6,4 \text{ cm}}{3,2 \text{ cm}} = 2$

2x plus facile

$GM = \frac{F_{\text{à exercer}}}{F_{\text{à soulever}}} = \frac{F_{\text{à soulever}}}{F_{\text{à exercer}}} = \frac{F_p}{F_{\text{traction}}}$

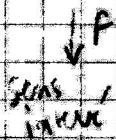
$F_{\text{traction}} = \frac{F_p}{GM} = \frac{200}{2} = 100 \text{ N}$ force à exercer 1/2



$F_p = 200 \text{ N}$

$\Delta x_{F_{\text{poussé}}} = 2 \cdot \Delta x_p = 2 \cdot 0,5 = 1 \text{ m}$ déplacement de 1 m pour 2x

Δx



$W_{F_{\text{traction}}} = F_{\text{traction}} \cdot \Delta x_{\text{force}} = 100 \cdot 1 = 100 \text{ J}$ travail

$GM = 2$ car bras de force = 2x bras de charge.

M2 $F_p = 200 \text{ N}$ $\Delta x = 0,5 \text{ m}$

A) Possible mais 3 $GM = \text{nombre de fils porteurs} = 3$

$GM = \frac{F_{\text{à soulever}}}{F_{\text{à exercer}}} = 3$

$F_{\text{à exercer}} = \frac{F_{\text{à soulever}}}{GM} = \frac{200}{3} = 100 \text{ N}$

$\Delta x_{F_{\text{poussé}}} = GM \cdot \Delta x_p = 3 \cdot 0,5 = 1,5 \text{ m}$

$W = F \cdot \Delta x \cdot \cos \alpha = 100 \cdot 1,5 = 150 \text{ J}$

g) Poulie $v_M = \text{nombre de fils porteurs} = 5$

$$F_{\text{exercice}} = \frac{F_{\text{coulombes}}}{v_M} = \frac{200}{5} = 40 \text{ N}$$

↑
sans
frottement

$$\Delta x_{\text{force}} = \Delta x_{\text{charge}} \cdot v_M = 0,5 \cdot 5 = 2,5 \text{ m}$$

$$W_{\text{poulie}} = F \cdot \Delta x (\text{sans}) = 40 \cdot 2,5 = 100 \text{ J}$$

M3 Plan incliné

$$v_M = \frac{\text{longueur pente}}{\text{hauteur plan incliné}} = \frac{6,4 \text{ m}}{3,2 \text{ m}} = 2$$

$$F_{\text{exercice}} = \frac{F_{\text{coulombes}}}{v_M} = \frac{200}{2} = 100 \text{ N}$$

$$\Delta x_{\text{force}} = \Delta x_{\text{charge}} \cdot v_M = 0,5 \cdot 2 = 1 \text{ m}$$

$$W_{\text{plan incliné}} = F \cdot \Delta x (\text{sans}) = 100 \cdot 1 = 100 \text{ J}$$

Fraction
→
Δx
x=0

M4 poulie mobile 2 fils porteurs $v_M = 2$

$$\text{plan incliné} = \frac{\text{longueur pente}}{\text{hauteur}} = \frac{4 \text{ m}}{2,2 \text{ m}} = 2,19$$

$$2x \times 2x = 4x + \text{poulie } v_M = 4$$

$$m = 25 \text{ kg}$$

$$F_p = m \cdot g = 250 \text{ N}$$

$$\Delta x = 10 \text{ m}$$

$$= 2500 \text{ J}$$

$$F_{\text{exercice}} = \frac{F_{\text{coulombes}}}{v_M} = \frac{2500}{2,19} = 1142 \text{ N}$$

Bonus : avec frottement

$$F_{\text{exercice}} = 2750 \text{ N}$$