

①

From a recuperation energy

Centrale NP 12

Q1 ...

Q2

$$\gamma = -2$$

$$V = -2t + V_0$$

$$V = -2t + 13,5$$

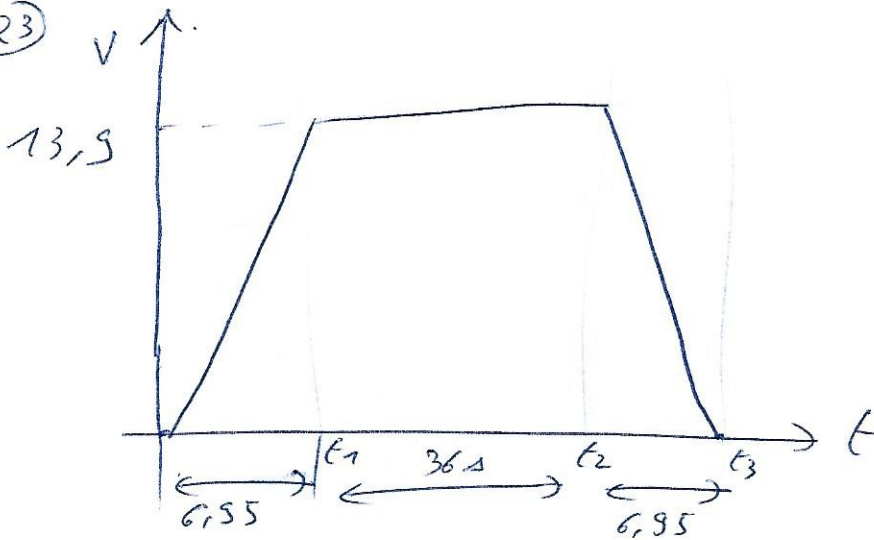
$$x = -2t^2 + 13,5t$$

$$\text{from } t = 6,55 \text{ s} \Rightarrow x = 48,3 \text{ m}$$

$$V_0 = 50 \times \frac{1000}{3600} = 13,5 \text{ m/s}$$

$$V = 0 \text{ from } t = \frac{13,5}{2} = 6,55 \text{ s}$$

Q3



$$\text{from } V = dt = 13,5$$

$$V = \frac{d}{t} \Rightarrow t = \frac{500}{13,5} = 36$$

Q4

$$E_c = \frac{1}{2} m \cdot V^2$$

$$TEC \Rightarrow m V \gamma = \eta \times P_{elec} - f \cdot V^2$$

$$\Rightarrow P_{elec} = \frac{1}{\eta} (m \cdot V \cdot \gamma + f V^2)$$

$$\underline{P_{rec}}: P_{elec} = \eta \cdot P_{elec} + (1 - \eta) P_{elec} = P_{utile} + P_{perturb}$$

Q5

$$W = \int_0^{t_1} P_{elec} \cdot dt \quad \text{avec } \left| \begin{array}{l} \gamma = 2 \text{ et } V = 2 \cdot t ; t = 6,55 \\ n = 1600 ; \eta = 0,7 ; f = 16 \end{array} \right.$$

$$\text{On trouve } W = 231 \text{ kJ}$$

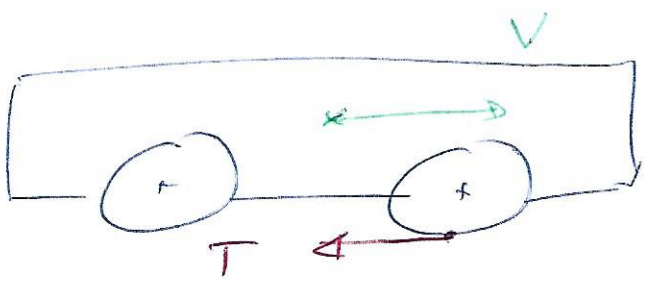
Q6

$$P_{elec} = \frac{1}{\eta} f \cdot V^2 \quad \text{avec } V = 13,5$$

$$W = \frac{1}{\eta} f V^2 \times 36 = 755 \text{ kJ}$$

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Q9 On isole le vehicule :

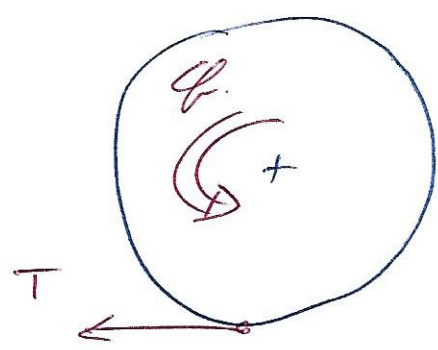


TRD $\Rightarrow \pi r = +T$

On isole les roues avant :

TRD $\Rightarrow \varphi = R \times T$

$\Rightarrow \varphi = R \cdot \pi \cdot r$



Q10 $T = \pi r = 3200 \text{ N}$

$F_{av} = \pi (-0,26 \cdot r + 0,48 \cdot r) = 7664 \text{ N}$

$T_{max} = f \times F_{av} = 7664 \text{ N} > 3200 \text{ N}$

Q11 $r = 6,53$

$T = \pi r = 10288 \text{ N}$

$T_{max} = f \times F_{av} = 9399 \text{ N} < 10288 \text{ N}$ 16