task_f64r8g2jf4pdomfi_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

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Exercise E1 Conversion: Energy, Power and Area

A Tesla Model 3 has an average power consumption of [illegible] km}}$ and an usable battery capacity of $60~{\rm kWh}$. Solar panels produces per $1~\rm m^2$ in average in December $0.2~{{{\rm kWh}}\over{{\rm m^{2}}}}$. The car is driven $50~{\rm km}$ per day. The size of a distinct Solar module with $460~{\rm Wp}$ (Wpeak) is $1.9~{\rm m} \times 1.1~{\rm m}$.

Result

Solution

\begin{align*} [illegible] \end{align*}

1. What is the average power consumption of the car per day?

\begin{align*} [illegible] {\rm panel }}} = {{40~{\rm m^{2}}}\over{2.1~{\rm m^{2}/panel}}} \\ &= 19.04~{\rm panels} \rightarrow 20~{\rm panels} \end{align*}

Solution

\begin{align*} {{W}\over{l}} &= {{16~{\rm kWh}}\over{100~{\rm km}}} = 0.16 {{~{\rm kWh}}\over{~{\rm km}}} \\ W &= 50~{\rm km} \cdot 0.16 {{~{\rm kWh}}\over{~{\rm km}}} = 8~{\rm kWh} \end{align*}