

task_f64r8g2jf4pdomfi_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

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conversions, energy, power, area, chapter1 1

Exercise E1 Conversion: Energy, Power and Area

2. The number of solar panels and the length of a solar panel is 1.9 m (width) and 2.1 m (length) over December. Result

is \$1.9~{\rm m} \times 1.1~{\rm m}\$\$. Solar panels produces per \$1~{\rm m}^2\$ in average in December \$0.2~{\rm kWh}/{\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}\$.

$$W = 460 \text{ (Wp)} / 200 \text{ (km)} = 2.3 \text{ (kWh/km)}$$

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

$$A = 1.9 \text{ (m)} \times 2.1 \text{ (m)} = 4.0 \text{ (m}^2\text{)} \\ W_{\text{panel}} = 460 \text{ (Wp)} / 4.0 \text{ (m}^2\text{)} = 115 \text{ (W/m}^2\text{)} \\ \text{Solution: } 115 \text{ (W/m}^2\text{)} \times 2.1 \text{ (m}^2\text{/panel)} = 241.5 \text{ (W/panel)} \\ 241.5 \text{ (W/panel)} \times 20 \text{ (panels)} = 4830 \text{ (W)} = 4.83 \text{ (kW)} \\ 4.83 \text{ (kW)} \times 24 \text{ (h)} = 115.92 \text{ (kWh)} \\ 115.92 \text{ (kWh)} / 100 \text{ (km)} = 1.1592 \text{ (kWh/km)} \\ 1.1592 \text{ (kWh/km)} \times 50 \text{ (km)} = 57.96 \text{ (kWh)}$$

$$\frac{W}{l} = \frac{16 \text{ kWh}}{100 \text{ km}} = 0.16 \text{ kWh/km} \\ W = 50 \text{ km} \cdot 0.16 \text{ kWh/km} = 8 \text{ kWh}$$

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