

task_239xqp7zjr32bv4a_with_calculation

Student Group

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Exercise E12 Conversions: Speed, Energy, and Power

1. A vehicle speed of $80.00 \frac{\text{km}}{\text{h}}$ in $\frac{\text{m}}{\text{s}}$
2. The energy of 60.0 kWh in J
3. A battery with a capacity of 10.0 Ah and a voltage of $1.6 \times 10^{-19} \text{ C}$

Solution

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\begin{align*}
v &= 80.00 \frac{\text{km}}{\text{h}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1 \text{ h}}{3600 \text{ s}} = 22.22 \frac{\text{m}}{\text{s}} \\
E &= 60.0 \text{ kWh} = 60.0 \text{ kWh} \cdot \frac{3600 \text{ s}}{1 \text{ h}} \cdot \frac{1000 \text{ W}}{1 \text{ kW}} = 2.16 \times 10^8 \text{ J} \\
Q &= 10.0 \text{ Ah} = 10.0 \text{ Ah} \cdot \frac{3600 \text{ s}}{1 \text{ h}} = 3.6 \times 10^4 \text{ As} \\
I &= \frac{Q}{t} = \frac{3.6 \times 10^4 \text{ As}}{3600 \text{ s}} = 10.0 \text{ A}
\end{align*}

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